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TUBERCULOSIS FROM A SANITARY AND PATHOLOGICAL POINT OF VIEW.

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(*Continued from page* 5.)

WITH regard to the etiology of Tuberculosis, I think I need scarcely trespass on this ground. Very many of the influences which have been supposed to operate in its production do not bear any relation to it, except as predisposing causes, or those which facilitate the transmission of its virulent principles. Overcrowding, neglect of hygiene, long-continued and severe lactation, and poverty are predisposing causes, while they accelerate the course of the malady when it is developed. The same may be said of damp and cold; and it may be mentioned that while the disease prevails in warm and dry, as well as cold and damp situations, it is rarely observed in the steppes of Russia, or in Siberia. Hyper-lactation has been blamed as a cause—chiefly, I think, because milch cows are often affected. But it must be remembered that there are two or three times more cows than bulls or oxen; and if we take Adams' figures, we shall find that the proportion of the latter to the former shows that the males are as much involved as the females. It must not be forgotten, also, that cows are kept alive a longer time than bullocks or bulls, and, besides, they are more exposed to infection by cohabitation. Food of different kinds or qualities will not produce the disease; neither will any antecedent malady. Suppurative diseases or

accidents are far more common in the horse than in the bovine species, and yet the existence of Tuberculosis is scarcely ever noted in the former. The malady is also said to complicate certain diseases, such as Pleurisy, Pneumonia, Bronchitis, Catarrh, etc., but these have no relationship to it, and when they are present are only evidence of the disease itself, which has produced them.

The disease is looked upon as hereditary, and there are strong points which bear in favour of this view. It is certainly a transmissible malady from mother to fœtus; for Jessen, at Dorpat, found in three aborted calves of three months, both lungs infarcted with newly-formed nodules, which Gemmer examined microscopically and declared to be tubercles. But, nevertheless, the question of heredity, except entailing predisposition to the disease, is not easily solved, for its transmission by infection only too often complicates the inquiry.

This brings me to the, perhaps, most important part of my paper, the infectiousness or contagiousness of Tuberculosis. Though long suspected, this unfortunate property of such a serious disorder has only recently been demonstrated. In my previous writings, as well as in the VETERINARY JOURNAL, will be found the evidence of several veterinarians to this effect; and peremptory facts of infection by cohabitation have been published by Cruzel, Zannger, Grad, Dupont, Zundel, Viseur, Haushalter, Mitchell, Dewar, Gray, Walley, and others. On the Continent, breeders of cattle and graziers, as well as feeders, dairymen, and others, have, more or less, held this opinion for a long time. In Switzerland and France this appears to have been a very prevalent belief. From the facts before us, there is reason to think that, like Glanders, which it so much resembles in many points, the disease may, in exceptional circumstances, be conveyed by the breath from diseased to healthy animals. To a certain extent the truth of this has been experimentally demonstrated by Tappeiner, who produced the disease by causing small animals to inhale the dried sputa of phthisical people.

Viseur, of Arras, and Grad, of Wasseloune, Alsace, give evidence which proves in the most conclusive manner, that not only is the disease communicable by cohabitation of healthy with

diseased cattle, but that stalls and cowsheds may become so contaminated by animals suffering from Tuberculosis, that these places will infect sound cattle which afterwards inhabit them. Tappeiner, of Meran, attempted to ascertain whether animals could not be rendered tuberculous, by causing them to inhale with the breath fine particles of sputa from phthisical people—such particles, in fact, as would be atomised into the air by the patient's cough, and, if at all infective, would produce the disease in other persons inhaling them. The animals experimented on were made to breathe for several hours daily in a chamber, in the air of which fine particles of phthisical sputum were suspended. The sputum having been mixed with water, the mixture was atomised by a steam atomiser. In all cases the sputa was from persons with cavities in their lungs. Dogs alone were employed in the experiments, since they very rarely suffer from spontaneous Tuberculosis. The result was, that of eleven animals experimented on, with one doubtful exception, and after a period varying from twenty-five to forty-five days, all, being killed, presented well-developed miliary tubercles in both lungs; and in most of the cases tubercles were present to a smaller extent in the kidneys, and in some cases also in the liver and spleen. Microscopical examination was in accord with the naked-eye appearances.

The quantity of sputum necessary for the effect is certainly a very small one. In three experiments, only one gramme of sputum was daily atomised in the air of the chamber, and the quantity of dry sputum must have been exceedingly small. Two ways are conceivable in which the infection is produced. The particles certainly may reach the alveoli; for powdered sinnabar administered in the same way was found to have stained the alveoli in twelve hours, after an inhalation of only one hour's duration. But some particles may lodge in the mucous membrane of the throat and pharynx, and thence, being absorbed, may affect the lungs as organs specially predisposed. Hence some comparative experiments were made by feeding dogs with the same sputum as that employed in the inhalation experiments. Fifteen grammes were mixed daily with the food of each dog. In two dogs fed at Munich, miliary tubercles were found in the

lungs after six weeks' feeding; in six others fed at Meran all the organs were normal—a difference the explanation of which is not very clear. In the cases in which the disease was produced by feeding, the intestinal tract was affected, whereas it was free in those cases in which the inhalation was employed. It is remarkable that, with two exceptions, the animals, up to the time at which they were killed and found diseased, were well and lively, and indicated their disease neither by emaciation nor other external symptoms. This suggests that sometimes in man a miliary Tuberculosis of the lungs may remain latent, and cause no symptoms until a Catarrh, accompanied with foci of inflammation, sets up Phthisis.

This question of infection is a most important one from a sanitary point of view. On many occasions it has been noted that there was a strange persistency of Tuberculosis in certain cattle-sheds, which, so far as hygiene was concerned, left little to be desired. Notwithstanding new purchases, good housing and feeding, animals the most healthy were attacked after being located for some time in these sheds; while in other sheds, under far less favourable health conditions, but into which the disease had not been introduced, the cows remained free from it. Haushalter has noticed that when young animals are placed near diseased ones, they readily become infected. Infection through the medium of the atmosphere probably only takes place when the diseased animals have cough (which is a very common symptom), and there are deposits of tubercle undergoing caseous softening in the pharynx, larynx, or other portions of the air-passages, or tubercular cavities in the parenchyma of the lungs communicating with these passages. The act of coughing must throw up into the surrounding air quantities of particles of tubercular matter capable of infecting animals —and especially if young—in the immediate vicinity. It is scarcely necessary to remark that the infectiousness of Phthisis in mankind has long been suspected, and often asserted by high medical authorities.

As to the inoculability of the disease, there are now hundreds of positive experiments to prove it.

It has been shown in an undeniable manner that, like Glan-

ders, Tuberculosis can be produced in healthy animals by inoculating them with tuberculous matter from man or other creatures. In the last century, Kostum attempted some inoculation experiments, and obtained positive results; after him came Klencke, who also was successful. But it was only in recent days that Villemin commenced that series of experiments, continued by a host of other pathologists—human and veterinary—which show in the clearest manner that the disease is inoculable from man to animals, and from animals to animals—is, in fact, a true inoculable disease. Transmission can be effected in this way, not only by the tuberculous matter, but also by the bronchial secretion and the blood, the same as the most characteristic virulent maladies—such as Glanders. With a very small quantity of tuberculous matter, Chauveau was able, by injection, to produce in the lungs of solipeds an eruption of miliary tubercles; when a larger quantity was injected, great pulmonary infiltrations were the result. Bovines were most readily infected in this way. But, like some other virulent maladies, again, the disease can be produced through the intact mucous membranes—as that of the digestive canal—and this renders this particular disease all the more formidable. In the writings referred to, I have shown that many experimenters—notably Gerlach, Klebs, Perroncito, Harms, Villemin, Rivolta, Saint-Cyr, and others—produced the disease by feeding animals with human or bovine tubercle, and the flesh and milk of tuberculous animals. The alterations produced were sometimes slight, in others quite startling, and rarely were they negative. The most recent experiments are those by Professor Orth, of Gottingen. In these, tuberculous matter from the cow was employed, the inoculated animals being rabbits. He introduced as far into their mouth as possible, by means of blunt forceps, morsels of matter the size of a small pea, which the majority of the animals readily swallowed: using raw, freshly-developed grey tubercle, as well as that which was undergoing caseous metamorphosis. He also employed human tubercle derived from caseous Pneumonia, and which was administered partly raw, and partly after having been boiled for ten to fifteen minutes. Fifteen animals were fed with matter from diseased cattle, and nine of these were infected; while

those to which the caseous matter from human lungs had been given remained apparently healthy. Of the nine infected animals, four died, and the remaining five became extremely emaciated, and were killed. On examination of the bodies, nearly all the organs were found involved in Tuberculosis. In all, the glands were affected, but the serous and mucous membranes, lymphatic glands, liver, spleen, kidneys, and omentum were infected in various degrees. In some the mucous membrane of the pharynx was thickened, the surface ulcerated and covered with a cheesy matter. In one a deposit of tubercle had taken place in the tonsils, and at the base of the tongue were grey and yellowish tubercles; while on each side of the neck the lymphatic glands were greatly enlarged, and contained a number of yellow caseous deposits, partly discrete, partly confluent. These alterations in the lymphatic glands—various in number and in different stages of regression—were found in seven of the nine rabbits.

One of Orth's conclusions was that the virus of Tuberculosis penetrates the intact mucous membranes, resists the action of the digestive fluids, and constitutes a most dangerous poison.

Yet more recently, Professor Cohnheim,* of Leipzig, has added his testimony to the vast amount of evidence already accumulated as to the contagiousness of Tuberculosis, and has supplemented the experiments of Orth and previous experimenters, by others even more conclusive. He demonstrates that the test for tubercle is no longer limited to certain qualities of colour or consistence, nor in the presence of certain microscopical elements; but really in the power of a morbid product, when introduced into the body of an animal, to produce Tuberculosis in it. Cohnheim insists that what produces Tuberculosis is tubercle, and what fails to produce the disease is not tubercle. So that, judged by this criterion, the doctrine of Laennec is confirmed as to the identity in origin of caseous Pneumonia and miliary Tuberculosis, both being due to one virus; while Scrofula is also proved to be identical in the same direction, the scrofulous lymphatic gland being likewise the repository of the infective

* *Die Tuberkulose vom Standpunkte der Infectionslehre.* Leipzig, 1880. See *The British Medical Journal* for May 8, 1880.

principle. Cohnheim, however, remarks what had long ago been noted, that all animals do not become infected with the same readiness.

Dogs, for example, show little susceptibility, whilst rabbits and guinea-pigs have it in a remarkable degree. The way in which the tuberculous substance is introduced into the animal is almost a matter of indifference; the common and most convenient method of procedure is inoculation by a small incision either into the subcutaneous tissue, the pleural or peritoneal cavities, of the anterior chamber of the eye. Whether there is much or little tubercular substance employed, whether it is used alone or mixed with other tissues—as, for example, pieces of lung containing tubercular nodules—is of little importance; of far greater consequence, on the other hand, is it that the substance used should be fresh and free from decomposition. The fresher it is, the less likely is the experiment to be affected by septic and similar influences, and infection is the more certain. How the infection takes place, is best seen in animals when the tubercular matter has been introduced into the anterior chamber of the eye. In this case, if the substance be absolutely fresh, the irritation produced by the introduction soon passes away, the small portion introduced becomes gradually smaller and smaller, and may even completely disappear. Then, for a time, the eye is completely clear and intact, until suddenly on the iris a smaller or larger number of minute grey nodules appear, which grow to a certain size, and then caseate, exactly as happens with human tubercle. In the rabbit, Salomonsen and Cohnheim observed the eruption usually about the twenty-first day after inoculation; in guinea-pigs, as a rule, a week earlier. In the rabbit, also, the period of incubation is sometimes shortened to fourteen days.

Human tubercle or caseating scrofulous products alike produce Tuberculosis when inoculated, showing that in both the virus is the same; and the products are effective in the same degree. If a morsel of tubercular peritoneum or cerebral membrane be introduced into the peritoneal cavity of a rabbit, typical Tuberculosis, commencing in the abdominal organs, is the result. But inoculation with a piece of lung affected with caseating

Pneumonia, or of a caseating testicle, produces exactly the same effect; and nothing succeeds better than a freshly excised scrofulous lymphatic gland from the neck.

The real test for tubercle, until the active agent in producing Tuberculosis is discovered, is inoculation, or rather infection; and the leading principle in this, as in all other infecting maladies which produce local changes, is that a tubercular or scrofulous product is generated wherever the tubercular virus remains for a certain time. In order, therefore, to determine the localisation of the disease, the mode of introduction must be looked upon as the chief factor. When the virus is once introduced, the extension of the malady is influenced by the conditions of the structure of the part, and follows the natural paths of the organism. Consequently, while on the one hand, the course which the disease takes is very different in different cases, the eventual entrance of the virus into the circulation affords the conditions for the development of tubercle in distant organs. The influence of the point of introduction is strikingly exemplified by inoculation experiments. When a small piece of tubercle is introduced into the peritoneal cavity, there constantly follows, in the first instance, Tuberculosis of the peritoneum, spleen, and liver; after inoculation into the anterior chamber of the eye, the iris is first affected; after feeding with tubercular matter, the intestine and the mesenteric glands; after the inhalation of pulverised sputa, the lungs and bronchial glands; and, when the material has been introduced into the subcutaneous connective tissue, it is the nearest lymphatic glands in which the disease first develops.

That the lungs are affected with tubercular disease in a far larger ratio than other organs shows, in Professor Cohnheim's opinion, that the poison is introduced into the economy most frequently with the inspired air. This conception finds support, he believes, in the frequency with which the bronchial and tracheal lymphatic glands are affected in a very early stage of the disease—so much so, that an extensive tubercular pleurisy, and still more frequently advanced caseation of the glands, is found; whilst in the lungs there are only discovered a few nodules, or a very scanty amount of caseous infiltration. An

analogous condition is observed in the certainty and rapidity with which inhaled carbonaceous particles reach the pleura and bronchial glands. The conditions which determine whether the inhaled virus shall produce disseminated tubercle or caseous pneumonia are still unknown.

Whilst the pleura and bronchial glands become diseased immediately after or simultaneously with the lungs, the anatomical relations of the air-passages with each other and the digestive canal furnish the means for further development of the disease. So soon as a breaking down of tubercular products and consequent ulceration have taken place, a certain quantity of tubercular, that is to say, of infecting matter, must leave the lungs. This reaches the trachea and larynx, and, if it take root there, tubercle and tubercular ulceration are the consequence. Then come the pharynx, the soft palate, the root of the tongue, and tonsillar region, which are all exposed to the same influence. A certain proportion of the matter is swallowed, but the passage through the œsophagus is too rapid, and undoubtedly the acid reaction of the gastric juice too adverse to the local inoculation and further development of the organised tubercle poison, to favour the development of the disease in the œsophagus and stomach, where Tuberculosis is exceedingly rare. When, in consequence of the swallowing of large quantities of tubercular matter, catarrh of the stomach has been produced, the chief obstacle to the transmission of the virus into the intestine is overcome. In the bowel, infection will most likely follow at points where the intestinal contents are longest detained; that is to say, in the neighbourhood of the ileo-cæcal valve, the lower portion of the ileum, the cæcum, and ascending colon. The upper and lower extremities of the tube are less exposed. It is easily ascertainable in what parts of the intestinal wall the tubercle is most likely to fix itself—on those points, namely, where all absorbed substances are first retained; that is to say, in the lymphatic structures, the isolated and grouped lymph follicles. These are, in fact, as is well known, the seat of caseating and tubercular ulcers of the intestine. Simultaneously with or immediately following the development of the virus in the follicles comes the development in the mesenteric glands; whilst, on the

other hand, the tubercular ulcers admit the poison into the branches of the portal vein, and the liver is then endangered. How frequent is Tuberculosis of the liver, every one knows who has taken the trouble to examine this organ with sufficient care in all cases of chronic Tuberculosis. With this combination, consumptive disease of the lungs and intestine frequently ends; but further developments sometimes take place. The disease may enter the ductus choledochus and produce Tuberculosis of the bile-ducts. More frequent and more important is transmission to the peritoneum from deep ulcers of the intestine. And the virus inhaled with the atmospheric air may take root directly in the larynx and trachea, producing the so-called primary Tuberculosis of the larynx.

Whilst the tubercular disease of the digestive tube which has been described in the foregoing sketch is secondary to the affection of the lungs, there are cases in which the intestinal canal admits the virus into the system for the first time. Amongst this class of cases, Professor Cohnheim reckons advanced tubercular disease of the mesenteric glands and peritoneum, without disease, or with only a very slight disease of the lungs—a form of the affection rare in adults, but unfortunately very common in young children.

Professor Cohnheim's remarks on uro-genital Tuberculosis are very suggestive. Direct infection from one sex to the other, as in Syphilis, although not impossible, is scarcely to be expected. If the virus from Tuberculosis of the uterus ever is transmitted *in coitu* to the male urethra, or, perhaps, what is not so unlikely, if a man with Tuberculosis of the lungs or other organ can transmit the tubercular virus to the genital mucous membrane of a woman, such cases must still be very exceptional, as a rule, uro-genital Tuberculosis is a disease of excretion. The virus, from whatever source it has entered the blood, is excreted by the kidneys, and doubtless, like cinnabar particles, oil-drops, milk-globules, and bacteria, through the glomeruli. It by this means gets access to the urinary passages, and, on whatever point it gets a hold, Tuberculosis develops. Most frequently, this takes place in the open canalicula of the pyramids; but the disease may develop also in the pelvis of the kidney, in the ureter, and

the bladder, and even in the prostatic portion of the urethra Tuberculosis may occur. It may cross in the bladder to the other ureter, and ascend to the other kidney; more frequently, however, it is the urethra that is attacked. In the male, the virus attacks the prostate, thence passes by the *ductus ejaculatorii* to the seminal vesicles, and onwards to the vas deferens, epididymis, and testicle, but it can also pass directly where the ureter and the vas deferens cross. In the female, the anatomical arrangement of parts renders the route by the urinary passages very improbable. In the great majority of cases, the parts affected are the Fallopian tube and the uterine mucous membrane, the virus entering the tube from the peritoneum, which is scarcely ever found free from tubercle in genital Tuberculosis in the female.

Although analysis shows that uro-genital Tuberculosis is scarcely ever the primary outbreak, this cannot be said of all the parts where tubercle is localised. In meningeal Tuberculosis, there are cases, especially in children, in which the usual deposits in the lungs or glands are not to be found. How, in such cases, and even in those in which the deposits in other organs are present, is the transmission of the virus to the meninges of the brain to to be explained? Dr. Cohnheim is in such instances disposed to accept Weigert's explanation, who has suggested that the poison gets access to the membrane of the brain from the nose, passing through the foramina of the ethmoid bone.

Still more difficult of explanation are cases of tubercular disease of bone and fungating tubercular disease of joints, occurring in individuals in whose other organs no tubercular deposit is to be discovered. Although in most such cases the development of the local disease is traced to an injury, yet it is not to be supposed that an injury can beget the tubercular poison. Professor Cohnheim conceives it to be possible that, in such persons, the virus is already circulating in the blood, and that, with the exudation which follows the injury, the poison leaves the blood-vessels and engrafts itself in the tissues.

As a rule, the tubercular poison is not spread through the medium of the circulation, although in favourable instances this occurs; and metastatic tubercle, comparable to the most deve-

loped forms of metastatic inflammations and tumours, is sometimes found. When we add to this mode of infection the direct transmission from the peritoneum to the spleen, through the lymphatics of the diaphragm to the pleura, from the pleura to the pericardium, etc., we need not wonder at the number of organs that are sometimes found affected with Tuberculosis.

In explanation of instances of acute miliary Tuberculosis come the cases described by Ponfick, in which, as a cause of the contamination of the blood with large quantities of the poison, Tuberculosis and caseous infiltration of the thoracic duct were found. A more frequent cause, however, of this rapid form of the disease is Tuberculosis of the blood-vessels of the lungs, instances of which are recorded by Weigart. A local Tuberculosis of the pleura, bronchial glands, or mediastinum has extended into the wall of a pulmonary vein, and a large surface of caseating tubercular substance has projected into the lumen of the vessel. In the light of these discoveries, acute miliary Tuberculosis loses much of its mystery.

When the chronic nature of scrofulous affection of the lymphatic glands, and the immunity to the general health that often follows it and scrofulous disease of the joints, are compared with the rapid and deadly course of acute Tuberculosis, it may seem extraordinary that they are all attributable to the same poison ; but inoculation of rabbits shows that they all produce the same disease—a pure Tuberculosis. In endeavouring to account for the comparative innocence of some classes of cases, it must not be forgotten that the human organism may even overcome entirely the poison. Tuberculosis can heal. Pathological anatomy has long known cretification and cicatrisation after tubercular deposit and ulceration. Professor Cohnheim, assuming the error of the dualistic theory of Syphilis, compares the localisation of tubercular affections with cases of syphilitic infection in which there is no manifestation of disease further than the nearest lymphatic glands. Individual differences in the behaviour of the organism which has been infected by tubercle are seen even in inoculated rabbits. When equally large pieces of the same caseating lymphatic gland are introduced into the peritoneal cavity or into the anterior chamber of

the eye of a number of Guinea-pigs or rabbits, the first outbreak of Tuberculosis takes place about the same time and in the same manner in all of them, but the further progress shows the greatest imaginable diversities. One animal succumbs after five weeks, and, on examining the body, nodules and caseation are found in almost every organ: the peritoneum, liver, spleen, lymphatic glands, the lungs, vascular walls, etc. A second lives over two months; a third, three months, and longer; in another, not only the eye but the lungs are almost completely filled with tubercle; in another, the respiratory organs are almost entirely free, whilst the abdominal organs are extensively affected; in a sixth, the eye is completely destroyed by caseous Panophthalmitis, whilst the animal is otherwise perfectly healthy, is not emaciated, eats well, and is strong and lively; and when finally, after many months, it is killed, tubercle is found nowhere except in the eye.

Professor Cohnheim will not have it that the different powers possessed by individuals of resisting the tubercle poison are due to the presence or absence of a phthisical or consumptive habit of body. The so-called consumptive habit of body has nothing to do, he believes, with a facility for receiving the virus, but is a product of the disease. Individuals with this phthisical habit of body are not specially predisposed to tubercle, they are already tubercular. In their case, the disease has been either acquired in early life or has been inherited. That Tuberculosis is hereditary is too well known to require to be more than stated; but translated into other language, that means nothing more or less than that the tubercle-virus can be transmitted in the semen and in the ovum. Whether it can, like the virus of small-pox, be transmitted to the fœtus through the placental circulation, remains yet to be learned. The only difference in this respect between it and the syphilitic poison is that, while the latter manifests itself in the offspring before or soon after birth, in the case of the tubercle poison the development takes place at a later period.

Thus, in the whole history of tubercle everything is due to the special nature of the poison and its effects. According to the present manner of looking at the subject, every man is tubercular in whose body the tubercular virus has taken root. There is, accord-

ingly, no predisposition for tubercle any more than there is a predisposition for Syphilis, although some persons are more easily infected than others. Nor is there any constitutional predisposition that causes hyperplastic or inflammatory products to caseate like tubercle instead of being absorbed or changed into connective tissue, but only those pathological products undergo the specific change which are already the product of the tubercular virus. Other than this, there is nothing in the whole course of Tuberculosis wherein there is a difference in principle between it and other diseases arising from local infection. Not even the fever is pathognomonic.

Let us scan the additional evidence we possess as to the communicability of Tuberculosis in animals. In the *Deutsche Zeitschrift für Thiermedicin und Vergleichende Pathologie* for September last, Professor Blumberg, of Kasan, Russia, gives an account of an experiment, one only of a large number which were followed with the same results. These experiments were made with sheep, animals very rarely affected with Tuberculosis. The animals were eight in number, and from one-and-a-half to two years old; they were kept in an airy, roomy stable. Their ordinary diet was good, and their temperature was regularly taken for a week before the experiment commenced. After the feeding with the tuberculous matter began, the temperature vacillated more or less, rising ½° to 1° (Cent.) above normal. Four of the sheep were fed with sputa from phthisical people, the other four with tuberculous matter from lungs. The material was given on bread, which the sheep readily ate. In order to make absorption of the matter more certain, the mucous membrane of the mouth was slightly scratched with a lancet before feeding. The sheep, Nos. 1, 2, 3, and 4 received on October 19th, 20th, and 24th, 1877, eight grammes each of sputum from phthisical people; Nos. 5, 6, 7, and 8 received on the 25th, 30th, and 31st of the same month, eight grammes of tuberculous matter rubbed from lungs in distilled water. This matter was obtained from people who had died in hospital.

In December the sheep were killed by opening the carotid artery. No. 1 sheep, when killed on the 30th of that month, was rather heavier than before the experiment. The mucous mem-

brane of the larynx and trachea was very hyperæmic, and covered with white foam; lungs œdematous, the right containing more blood than the left, its pleura very much thickened. Beneath the pleura was a very great number of hard grey nodules, as large as a pin's head. On the mucous membrane of the true stomach was a yellowish-white patch, about ½ centimetre wide, due to fatty degeneration of the epithelium. The mucous membrane of the small intestines was hyperæmic, and speckled with ecchymoses; Peyer's patches were swollen, and here and there were yellow nodules the size of a millet-seed. The mucous membrane of the cæcum was tumefied, reddened, and covered with tenacious mucus. The liver was dark brown and enlarged, and on the anterior surface of the right lobe were grey tubercles the size of millet-seeds.

No. 2 sheep was also heavier, and had likewise received sputa. It was killed on December 31st. The anterior lobule of the left lung was hepatised, and in the lung-tissue was an ecchinococcus cyst; at the posterior part of the lung were a number of grey tubercles. Grey-brown tubercles were also found on the upper surface of the spleen. Peyer's patches were likewise swollen; on the mucous membrane of the small intestines were studded yellow tubercles the size of a pin's head. The jejunum was covered with ecchymoses.

No. 3 sheep, also fed with sputa, was killed on December 30th. On the upper surface, and in the parenchyma of the lungs, were grey round nodules, of the size of a pin's head to that of a pea; the liver was in the same condition, while Peyer's patches were greatly swollen and surrounded by an areola; the mesenteric glands were swollen, and on the lining membrane of the jejunum was a streak of blood extravasation.

No. 4 sheep, also fed on sputa, was killed on December 31st. Under the pleura of the lungs, and especially the posterior portions, were grey nodules between the size of a millet-seed and a small pea. The lining membrane of the colon was speckled with ecchymoses, and Peyer's patches were swollen, and they were studded with small yellow nodules. The mesenteric glands were enlarged, and contained the same kind of nodule.

No. 5 sheep, fed on tuberculous lung-substance. The

vessels of the pia-mater on the upper side of the large hemisphere were injected, and the brain-substance was hyperæmic and somewhat œdematous. The lining membrane of the air-passages was reddened, swollen, and covered with thick tenacious mucus. Under the pleura of the left lung were greyish-yellow nodules the size of a pea, with a yellow caseous centre. On the upper surface of the liver and spleen were grey and yellow nodules the size of millet-seeds.

No. 6 sheep, fed on the same material, and killed on December 21st. Pia-mater injected; lining membrane of air-passages swollen, reddened, and œdematous. Lungs hyperæmic, and their anterior part, especially the left lobes, hepatised; they were studded with small grey nodules of various sizes. The liver was also studded with white concretions, from the size of a pea to that of a hazel-nut.

No. 7 sheep, fed in the same way, and killed on December 29th. Mucous membrane of larynx and air-passages very red and somewhat swollen, lungs congested, and their upper surface showing a number of nodules of various sizes. The anterior surface of the liver here and there had yellow patches, due to partial fatty degeneration of the liver-cells. The lining membrane of the true stomach was hyperæmic, and showing a large yellowish patch; that of the duodenum and jejunum was congested and showed small blood extravasations; Peyer's patches and mesenteric glands were rather swollen.

No. 8 sheep, fed in the same manner, and killed on December 29th. Parenchyma of left lung had a dark-brown streak, of the consistence of liver, and containing an abscess the size of a pea. In the right lobe of the liver were two small white concretions. There was a large ecchymoses in the duodenum.

Blumberg gives a histological description of the miliary tubercles found in the lungs and liver. He did not find any giant cells, which Schüppel asserts are characteristic of tubercles.

Of the eight experiments, the necropsies yielded evidences of positive results in seven. Feeding with sputa gave positive results in all cases, while that with tuberculous lungs yielded three positive, and one negative result (No. 8). The comparatively feeble infection in most of the cases was probably due to the short

period the animals were allowed to live, and the paucity of material at disposal. The result was looked upon as entirely corroborative of Villemin's views with regard to the specific nature of Tuberculosis.

Still more recently, Toussaint, of the Toulouse Veterinary School, has communicated the results of a series of experiments which further corroborate the evidence as to the virulent nature of tuberculous matter, and afford another striking demonstration of the certainty of tubercular infection through the digestive canal, and also by inoculation of very small quantities of matter. Toussaint has not only furnished us with additional proof in this direction, but he is also the first to demonstrate that the blood itself of tuberculous animals is as viruliferous as the caseous matter of the lungs or lymphatic glands. Toussaint, in pointing out that Tuberculosis is extremely rare, or altogether unknown, in the porcine species, shows that the experiments of Saint Cyr in 1874, and which have been since repeated by several pathologists, are evidence that the pig will, nevertheless, readily become infected. The reasons for the frequency of Tuberculosis in the cow, and its infrequency in the pig, while both are equally susceptible to it by experimental procedure, he explains in the *resumé* he gives of his own investigations.

His experiments were divided into three series. In the first, three pigs, in excellent health, and seven to eight months old, were submitted to experiment. On September 29th, 1879, No. 3 pig was isolated, and to Nos. 1 and 2 were given the entire lungs of a tuberculous cow, and which contained a considerable quantity of tubercles. These lungs the two pigs greedily devoured. Two days afterwards, the floor of the sty was carefully cleansed, and pig No. 3 was placed in it. No. 2, however, being a sow well advanced in pregnancy, was soon after put into a special sty, where she, in eighteen days, had a litter of eight young, four of which she unfortunately crushed. Toussaint could not examine the bodies of these, though he did not expect to find any lesions of Tuberculosis in them, as he imagined a sufficient interval had not elapsed. No. 1 pig was killed seventy-seven days after eating the lungs; it had become considerably emaciated during the last month. The autopsy showed very

advanced and generalised Tuberculosis. The lymphatic glands were hypertrophied; there was ulceration of the soft palate, and tubercular nodules in all the organs, as well as in the serous membranes of the abdominal cavity. No. 2 sow died in a state of extreme emaciation on January 10th, 1880, 101 days after feeding off the diseased lungs. In this animal there was also ulceration of the soft palate; all the lymphatic glands in the body had undergone calcareous degeneration,—the mammæ were full of tubercles, and all the parenchymatous organs in the thoracic and abdominal cavities were crowded with tubercles infiltrated with calcareous salts. On the same day as its mother, the remaining young pig died. It was also found to be tuberculous, but the lesions were less advanced; there was, however, very marked pulmonary hepatisation. With regard to No. 3 pig, which had been placed with Nos. 1 and 2, it maintained its condition. It was killed on January 12th, after a hundred days' cohabitation with the tuberculous pigs, and on examining its carcase commencing Tuberculosis was discovered. This was limited to the submaxillary and the bronchial lymphatic glands; there were also a few tubercles in the lungs. It appeared to be certain that the transmission of the disease in this instance had occurred through feeding out of the common trough.

In the second series of experiments, on December 18th, a young pig was given a portion of the lungs and lymphatic glands of No. 1. It was killed on January 12th, twenty-three days after ingestion of these. Nothing was apparent on the surface of organs, but the submaxillary were hypertrophied, and when examined microscopically tubercles in the first stage of development were discovered in their structure. On December 18th, a tuberculous lymphatic gland from No. 1 pig was scraped by means of a scalpel, and these scrapings, diluted with water were filtered through linen; the filtrate, to the amount of one cubic centimètre, was injected on the left side of the soft palate. On March 16th, 1880, fifty-seven days afterwards, the left submaxillary lymphatic gland was enormously swollen; that on the opposed side was scarcely tuberculous, and all the organs usually affected were found to be invaded with tubercular granulations, some of which were white in the centre.

The third series of experiments were commenced on January 11th, 1880, when a young pig received the tuberculous *débris* of No. 2 (which had died) to eat. On February 20th the submaxillary lymphatic glands were already voluminous; on March 16th, the animal was all but dead, and was killed. On examination there was found generalised Tuberculosis arrived at its last stage of development. The soft palate was likewise tuberculous. On January 11th, a pig two months old received some drops of blood from No. 2, by subcutaneous injection. An irregular, hard, and lobulated tumour formed at the seat of inoculation. Sixty-one days after the injection the animal was killed, when tubercles were found in the skin and glands, with numerous grey nodules in the pleuræ, lungs, liver, spleen and omentum.

In *resumé*, these experiments demonstrate that the lesions in the pig are those of acute Tuberculosis, and that they always bring about a fatal termination in a very short time—a few weeks. Tuberculosis in the pig is analogous to the galloping Phthisis of man. In the bovine species, on the contrary, Tuberculosis is most frequently chronic. It, therefore, results that the young animals of tuberculous parents offer the feeblest resistance to the disease, and die while young. With tuberculous adults, the rapid progress of the malady hinders reproduction. Finally, a few drops of blood are as virulent, in Tuberculosis, as the caseous matter of the glands or lungs. Infection, according to Toussaint, in cases of injection or contagion, takes place in the mouth.

That the flesh and milk will produce Tuberculosis when animals are fed with it, had been already conclusively shown by several veterinary experimenters, and especially Gerlach. These experiments I have described in the various works already cited. But it is to be noted that the experiments were nearly all performed on small animals, they being most convenient. Only the other day, I received an account of some most interesting and instructive experiments performed by Bollinger, of the Munich Veterinary School, on swine, goats, monkeys, and guinea-pigs, with the milk from tuberculous cows. In one instance, three pigs, six weeks old, were fed with the milk of a cow whose lungs were

recognised to be tuberculous, and at whose autopsy these organs were found to be affected with caseous Pneumonia, with Tuberculosis of the pleura, and bronchial, mediastinal, and mesenteric glands, as well as the uterus. The pigs died early in the experiment, unfortunately, and only in one were the laryngeal lymphatic glands found enlarged and softened.

In another instance, milk was obtained from a cow which, after death, showed Tuberculosis of the liver, peritoneum, ovaries, thoracic and abdominal glands, and pleura, with cheesy deposits in the lungs. This milk was given for about ten weeks to four healthy, three-weeks-old swine; it was uncooked, and from 1½ to 3 litres daily were allowed. During this period the throat glands were observed to enlarge. When from four to five months old, the pigs were killed, and were found to be affected with advanced Tuberculosis; more especially were the lungs, liver, and spleen involved, while the throat, bronchial, epigastric, and portal glands were extremely swollen and cheesy. In two of the swine there were small caseous follicular ulcers in the ileum. Control swine (same litter, but not fed on this food) remained healthy. A young pig fed for fourteen days longer with milk from the same cow, gradually wasted and died when 3½ months old—three weeks after the termination of the feeding. The autopsy revealed more especially caseous inflammation of the large intestine, an exquisite miliary Tuberculosis of the lungs, with great enlargement and caseification of the bronchial glands.

In another instance, six pigs of the same litter, from a healthy sow, were experimented upon, four being fed with this cow's milk also—two with uncooked milk, two with cooked, and the other two kept as control animals. After some months the control animals were killed, and found to be quite healthy; those fed with the cooked milk, when also killed, were affected with severe generalised Tuberculosis, while of those fed with uncooked milk one that died showed caseous (scrofulous) Enteritis, and the second, very unwell, was still alive. All the miliary tubercles in these had the histological characters of real tubercle, while the lymphatic glands showed the characters of these glands when tuberculous in man. The lymphatic glands of the throat had probably been infected from the pharynx; while the liver, and

portal and epigastric glands were infected from absorption of the virus by the stomach. From these experiments, it would appear that in swine Scrofula is first developed by the milk, then Tuberculosis—the one being only an advanced stage of the other.

It is most interesting to find these experiments of Bollinger's confirmed by an account of accidental infection of pigs, recorded in Walley's work. Mr. Bromley, M.R.C.V.S., of Lancaster, writes: "A short time ago, two pigs were killed in a farm in this neighbourhood; they had been fed with milk from a cow, afterwards found to be the subject of Tuberculosis, and from which she died; and upon *post-mortem* examination of these pigs, characteristic pulmonary and pleural tubercular lesions were discovered." Subsequently he writes: "The mother of the two pigs to which I referred in my last, has, within the past few days, been slaughtered. She was perfectly healthy, no trace of tubercular or other deposits being discoverable in any part of her body." This sow, if the case had been an experimental one, would have been the control animal.

Veterinary Surgeon Münch, of Straubig, in a recent report to the Bavarian Government, states that he considers it an undoubted fact that Tuberculosis appears among pigs as soon as they are fed for any length of time on milk from tuberculous cows. He knew two establishments in which 75 per cent. of the animals were affected with the disease through "in-and-in" breeding. The pigs suffered from Diarrhœa, wasted quickly, and died after being ill about three weeks. The autopsy always disclosed intestinal Tuberculosis, with tubercles in the mesenteric glands.

For further details in this matter of communicability of Tuberculosis, I refer you to Mr. Gray's excellent series of papers on this malady, in the VETERINARY JOURNAL (vol. viii.).

Now these startling facts of transmission point out to us, as veterinarians, some most important points with regard to the etiology of the disease, and they also account for its incessant increase. Young animals reared upon the milk of tuberculous cows will receive the infection, and develop the malady after a long or short interval, according to circumstances.

This impresses upon us the necessity for not breeding from animals tainted with the disease, nor allowing them to suckle young animals, if they are bred from; neither should their milk be given for consumption to any creature. They ought to be killed, and if not much infected, certain portions of their flesh may be allowed for food. The dwellings they inhabited should be treated as infected places, and cleansed and disinfected.

What risk does mankind incur though using the flesh and milk of infected animals? Very grave risk indeed; and in the paper in the medical journal previously mentioned I laid the greatest stress on this. When animals are in good condition, the tubercles localised, and the lymphatic glands not generally involved, then the flesh may be allowed to be sold for consumption—the diseased parts being destroyed. But when there is generalised Tuberculosis, or even an advanced stage of the disease in any important organs, then the flesh should not be consumed as food. More particularly should this be observed when there is emaciation. In any other chronic disease the flesh of emaciated animals is innutritious: in this it is so, and virulent as well.

With regard to the milk, this should invariably be condemned as highly dangerous. I have urgently pointed out the necessity for having all dairy stock carefully and regularly inspected by thoroughly competent veterinarians, with a view to discovering the earliest indications of the disease, and so to preserve, not only the lives of the healthy animals in contact with them, but also those of the people who consume their milk. One cannot experiment upon people, but judging from the close relationship between the pig and mankind, physiologically and anatomically speaking, there cannot be a doubt that our own would be as readily infected as the porcine species.

I have, years ago, thrown out the surmise that, as in pigs, much of the infantile Diarrhœa and Scrofula and Tuberculosis in man, might justly be attributed to infection from tuberculous cows, the comparatively long latency of the disorders masking their origin. A German, Doctor Stang, of Amborach, has given an instance of a child five years old, who had been allowed to consume, for a somewhat long period, the uncooked

milk of a tuberculous cow, and who died from Tuberculosis. Klencke, in 1846, gave another instance of death from Scrofula which was probably due to this cause. In the *Prager Vierteljahresschrift* (*Band* 142), Dr. Epstein, as the result of nine cases of Tuberculosis in infants from ten weeks to ten months old, including seven necropsies, concludes that the presence of the disease in infants is, in most cases, due to infection with the milk of a tuberculous mother, and not to hereditary predisposition, as is usually supposed. Two of the children were the offspring of healthy mothers, but one was suckled by a phthisical wet-nurse. Seven of the children were of phthisical mothers. In one of the cases there were intestinal ulcers and caseous infiltration of the mesenteric glands. Epstein remarked that the Tuberculosis of infants and young children differs from that of adults, in the great frequency with which the lymphatic glands, and especially the glands of the small intestines, are affected, and also in the comparative rarity of pulmonary disease in children. These facts appear to indicate that the starting-point in them and in adults is different; while in the adults and older children the infection is breathed in, it is ingested by infants and young children.

I have now endeavoured to bring before you this subject in all its importance. I have ventured to prove that Tuberculosis is a prevalent, and a continually-extending disease, affecting a large proportion of our bovine population; that it is very probably, almost certainly, infectious as from animal to animal; that the tuberculous matter, when inoculated, will certainly produce the disease in healthy animals, and just as certainly when they are fed with it; that the diseased flesh will also do this; and so will the milk of cows affected with Tuberculosis. The conclusions to be drawn from these facts I leave to your consideration, but of their importance, to my mind, there can be but one opinion.

ON THE OCCURRENCE OF CHEVRON BONES IN THE HORSE.

BY J. H. STEEL, M.R.C.V.S., DEMONSTRATOR OF ANATOMY, ROYAL VETERINARY COLLEGE.

"CONNECTED with the under surface of the caudal vertebræ of many animals which have the tail well developed, are certain bones, formed more or less in the form of an inverted arch, called *chevron bones* (French, *Os ent;* German, *unterbogen; hæmapophyses*, Owen). These are always situated nearly opposite to an intervertebral space, and are generally articulated both to the vertebra in front and the vertebra behind; but sometimes chiefly or entirely either to one or the other. They are usually articulated movably to prominences (*hypapophyses*) on the lower surface of the body of the vertebræ, but occasionally become anchylosed to it. They ossify from two centres, one on each side, which usually coalesce in the median line below, though not unfrequently, especially at the beginning and end of the series, where they are less developed, the two lateral portions remain permanently separate. They serve to give a larger surface of attachment for the inferior muscles of the tail, and also to protect the caudal vessels, which run within the canal formed by the series of these bony arches" (Flower, "Osteology of the Mammalia"). The above excellent account of chevron bones will suffice to inform us of the structures with which we have to deal. Flower continues his description of the caudal vertebræ, and describes these appendages of that region as occurring in monkeys, carnivora, cetacea, etc., but says:—"In ungulata, the tail is variable in length, but of simple character and function; it is never prehensile, *nor has it ever chevron bones*, although occasionally, as in the ox, a pair of well-developed hypapophyses may be produced so as to meet in the median line, enclosing a small canal." The rarity of the condition which I have observed in one case quite warrants the professor's statements. In dissecting the pelvis of an ordinary van-horse for purposes of demonstration, I noted the presence of unusual projections situated below the intervertebral disc of cartilage of 3-4 coccygeal vertebræ. From these prominences the compressores coccygis passed to their anterior attach-

ment. Closer investigation showed that the prominences are flattened from without inwards, and have their bases directly continuous by means of ligamentous structure with the superficial white fibrous portion of the cartilaginous disc. They are two in number, parallel with one another, and about one inch long and half an inch deep, consisting of cartilaginous structure with a central ossified portion in each. The supporting ligament is not complete posteriorly, but perforated for the passage of a lateral coccygeal branch of the inferior coccygeal artery, which has been coursing from before backwards below the vertebræ and here breaks up into two lateral portions. There cannot be the slightest doubt as to the nature of these bones. As to their value from a comparative point of view, they are a recurrence to primitive type—to the long, well-developed tail of the hipparion, and more distantly of the palæotherium and other ancestors of the horse. The caudal region in equus is much atrophied, perhaps having fallen a victim to the remarkable preponderance of the dorso-lumbar vertebræ. In our recent paper on "Individual Variations in the Ass," we have ventured to hint at a gradual passage of the vertebræ (into the dorsal region of equus), which, if it continue unchecked, will probably in thousands of years prevent the necessity of "docking," even if the taste for this operation recurs about that time and the humanitarians of that day are unable to persuade the public that nature is better than art. The animal which afforded us this specimen was behind his day in this respect, and thus gives us an indication of past conditions. These *hæmapophyses* are to the under part of the vertebræ what the neural laminæ are to the upper—they correspond to the lateral elements which coalesce along the central line to form the sternum in the dorsal region ; or, according to other anatomists, they are the homotypes of the dorsal sterno costal cartilages. Whether they are represented in the cervical and lumbar region is doubtful. In the DOG, chevron bones are often fairly well developed and meet together along the middle line, forming a sharply-pointed hæmal spine. They are seen beneath several of the vertebræ, usually the fourth and fifth, anchylosed to the one behind, having a markedly oblique direction forwards, and united, by ligament only, to that before. Their presence is obscurely

alluded to in Fleming's translation of Chauveau's "Anatomy" in the following terms:—"The last (vertebræ of the coccyx) are small V-shaped bones, which M. Goubaux has described by the name of *hypsiloid bones.*" It seems to us that the posterior vertebræ of a dog's tail are, as is usually the case in this region, only somewhat hour-glass shaped remnants of the body (centra) of the vertebræ, and that the bones mentioned by Chauveau are the chevron bones such as we have been describing. We rather regret the absence of some definite reference to the statements of the late Professor of Anatomy, now Director, of the Alfort Veterinary School.

ANTHRAX FEVER, OR LOODIANAH DISEASE, IN INDIA.

BY JAMES MILLS, M.R.C.V.S., ROYAL HORSE ARTILLERY.

(*Continued from page* 332, *vol. X.*)

Post-mortem Examinations.—Before entering into a description of the *post-mortem* appearances, a few remarks regarding the amount of care which ought to be exercised while performing these examinations in India, and more especially on animals which have died from this malady, may not be out of place, as we must consider that the dangers of infection are tenfold in such a climate, in comparison to what they are at home. As an illustration of the dangers we are exposed to, I will relate my own case. The last *post-mortem* examination which I made on a victim of Loodiana Disease, at Bareilly, was that of a mare, the carcase of which was simply a mass of putrefaction, and smelt horribly, yet I was anxious to see it carried out as far as possible; but I paid dearly for my anxiety, as next day I was attacked with acute diarrhœa and fever, which nearly cost me my life, and necessitated my remaining on the sick list for over a month, and so shattered was my health that I was compelled eventually to return to England. Therefore, from personal experience, I cannot urge too strongly the necessity there is for every conceivable measure being employed to prevent infection.

In temperate climates it is said that men who work in knackeries do not suffer in any way from the contaminated atmospheres which they breathe ; but change the conditions, and locate these men in a tropical zone, and see what the effect would be. I am confident such work would have a decided influence on their health, and in making a *post-mortem* examination, we are, *pro tem.*, placed under similar circumstances to these men, although our functions are scarcely the same. Certainly, the putrefaction you are brought into the presence of is comparatively of recent origin, but nevertheless it is dangerous and behoves you to be careful, as although this "odeur infecte" which is given off might not actually produce any specific disease, still you do not know to what extent it may injure you. Therefore, such conditions indicate the utmost precaution.

Remember that the subject you are now working on has ceased to be ; the vital spark has fled ; waste and decay, are no longer compensated by repair, and putrefaction is fast taking place. Consequently, if you wish your *post-mortem* examination to be of any value, perform it as soon as possible after death takes place.

When the patient dies, lose no time in freely sprinkling near to and around the carcase plenty of lime, or McDougal's disinfecting powder, and failing these, carbolic acid ; but under ordinary circumstances one, if not all of them, are procurable.

See that you have no cuts or abrasions of the skin of your hands. If the skin is not whole, do not attempt to perform the *post-mortem* examination yourself, or at least to touch any part of the animal, as you run the risk of inoculation.

Apply to your hands, before beginning to operate, a mixture of carbolic acid and oil or glycerine.

Have the carcase placed across the wind (if wind there be), and work scrupulously all the time on the windward side, so as to avoid as much as possible the inhalation of the foul air from it.

Always, if at all practicable, wear on such occasions clothing that will wash, as you are almost certain to get some drops of blood or other fluid on it ; therefore change it as soon as possible after you have finished the examination, and before again wearing the same suit have it thoroughly disinfected and washed.

Apply a solution of carbolic acid, or Condy's fluid, to all your instruments before using them, and when finished with have every one thoroughly cleaned with hot water and soap, and again apply the disinfectant above-mentioned—in fact, everything that has been used, or that has come in contact with the animal's body, ought to be treated as contaminated, and cleansed accordingly.

Post-mortem Appearances.—I append herewith copies of nine death reports. They were the only fatal cases amongst the R.A. troop horses on the occasion of the first outbreak, in 1877. They did not come under my own notice, having occurred before I assumed charge of the battery ; but as the *post-mortem* appearances are of considerable importance, I have taken the liberty of recopying these reports, as something may be learned from them.

"Death Report No. 1, Horses Nos. 67 and 109.—Both mares were dull and off their feed on the 16th, and appeared to be suffering from Fever, and were treated for it. No particular change took place until the evening of the 18th, when their throats began to swell. Strong liniment was applied, and hot fomentations, which were continued without any mitigation of the symptoms. By 9 a.m. on the 19th the throats of both mares were so swollen they could hardly breathe ; there was a bright yellow discharge from the nostrils. One died at 11 a.m. and the other at noon on the 19th. *Post-mortem* showed severe inflammation of the throat. Symptoms exactly the same in both cases."

"Death Report No. 2, Horse No. 68.—The mare was taken into hospital on 19th, suffering from Fever, which continued till her death, at 12 noon on 21st. *Post-mortem* inspection showed considerable ulceration of the intestines."

"Death Report No. 3, Horse No. 92.—The horse was taken ill about 10.30 p.m. on the 20th, burning heat all over the body, succeeded by chills and cold sweats. Swelling of the throat commenced, but seemed to yield to local treatment ; no discharge from nostrils. The horse died at 6 a.m. on 21st. *Post-mortem* inspection showed no symptoms, as far as I could see, to account for death. There was a slight inflammation of the throat. Stomach quite sound, and no symptoms of Colic."

"Death Report No. 4, Horse No. 92.*—When I arrived at this station I found patient suffering from malignant Fever. I have never seen a case of Loodiana Fever, but should say this closely resembles it. Considerable swelling of the glands; pulse imperceptible; respirations laboured and quick; membranes at first highly injected, afterwards black; abdominal pains, and entire loss of vitality. *Post-mortem* inspection:—Ulceration of stomach and small intestines; large quantity of yellow lymph all over his body."

"Death Report No. 5, Horse No. 3.—Patient was attacked yesterday morning, and in a few hours began to show symptoms of violent pain. Died in about fifteen hours. *Post-mortem* inspection:—Intense inflammation of stomach and small intestines, patches of ulceration, through one of which ingesta had forced itself, although there did not appear to be an inordinate quantity. Large quantity of lymph all over body."

"Death Report No. 6, Horse No. 96.—Lived seven days after being attacked. *Post-mortem* examination two hours after death. All the tissues very yellow; patches in small intestines, dark purple colour; and evident ulceration in duodenum and the double portion of the colon. Stomach slightly inflamed. Spleen enlarged and empty. Liver greatly congested. Lungs, the left one completely broken up, the right one congested; top portion gone. Pleura covered with yellow lymph half an inch thick. Head and membranes healthy except fluid in trachea. Brain and vessels congested."

"Death Report No. 7, Horse No. 55.—Patient was attacked yesterday, and died at midday to-day. No great agony; before death seemed to be turning putrid, quite cold, and membranes almost black. *Post-mortem* inspection:—First intestines appeared very yellow, and on removing them found large quantities of yellow serum. Great discoloration of small intestines and thickening. Colon at anterior portion very much inflamed, double portion contained a large quantity of semi-digested grass, to which clots of blood and mucus were clinging, and in parts some of the mucous membrane. Stomach greatly congested. Peyer's patches

* A remount, which got this number on the death of horse 92.

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inflamed, so that they were almost black. Spleen inflamed. Heart and lungs healthy, except the presence of fluid.

"Death Report No. 8, Horse No. 69.—Patient was attacked in the same way and at the same time as No. 55, recorded yesterday. *Post-mortem* examination the same as No. 55, only more yellow lymph visible."

Reports Nos. 1, 2, and 3 are those of the officer commanding the battery, and the remainder—viz., 4, 5, 6, 7, and 8—are those of my predecessor.

I regret very much that I am unable to give the *post-mortem* appearances as fully as I should have liked, having only had the opportunity of making three examinations; but I think from the above death reports, and the cases I shall now endeavour to describe, will be sufficient to enable us to recognise the disease.

1st.—A country-bred gelding, aged five years, belonging to 18th Bengal Cavalry. Duration of disease, three days twelve hours. Patient died suddenly and rather unexpectedly.

Post-mortem examination two hours after death revealed, externally, a well-nourished body, a slight swelling between the fore legs, but otherwise nothing to show the disease. Internally, on cutting into the abdominal cavity, none of the organs—with the exception of the liver and spleen, which were slightly enlarged—presented an unusually morbid appearance. There was the diagnostic yellow-amber tint of the body, with signs of inflammation having existed, but nothing more.

The chest contained a small quantity of fluid. The pleura was dropsical in appearance, and highly inflamed. The lungs were ecchymosed on their surface, and somewhat congested. The bronchial tubes were filled with a frothy mucus.

The pericardium had a considerable quantity of fluid in it; the heart was soft and flabby, and its tissues seemed to have undergone some change, they did not present that healthy striped appearance, but were of a homogeneous nature; the right cavities contained clots of tarry-coloured blood.

I did not see the animal before death, but from the fact of its having dropped down dead, together with the discovery of this diseased heart, and the absence of serious lesions in any other part of the body, leaves little doubt in my mind that the immediate

cause of death must have been due to the heart giving way, while the system was labouring under the malady. I tried to find out whether there was any previous history of this organ having been diseased, but as the animal had not been long in the regiment little was known of its constitution.

2nd.—A stud-bred gelding, aged, belonging to R.A. Duration of disease five days, and died somewhat suddenly, with symptoms of ruptured stomach.

Post-mortem examination one hour after death revealed, externally, great emaciation, with immense distension of the abdomen, which felt tense and tympanitic. Both hind legs were slightly swollen, but there were no other external indications of the disease. Internally, on cutting into the abdomen the result was an explosion of the most foul gas one could imagine; the abdominal cavity was found to contain the ingesta from the stomach, mixed with a large quantity of sanguineous fluid.

On examining the stomach, it presented a rupture about four inches long, the edges of the lesions showed that it had taken place at a part where ulceration existed. No doubt the process of ulceration had thinned the walls of the organ, and from the pressure of the ingesta, the result was this rupture.

The coats of the stomach and intestines were thickened, and to the feel were just like a piece of blubber from a seal. The cause of this thickening is evidently due to the infiltration into the connective tissue of the yellow, serous-looking fluid, found in this disease, which after death forms a jelly or blubbery-looking substance.

The intestinal ulceration was well marked in this case, but it did not extend beyond the small intestines; the duodenum seemed to suffer most, its surface presenting several ulcers, which had clean-cut edges, just as if they had been gouged out. Many of them penetrated into the muscular coat, and it seems only a wonder why there was not complete perforation, but I suppose the patient had not survived long enough for that to take place.

The mucous membrane of all the intestines was highly inflamed, blackened, and fast approaching putrefaction; it was also becoming detached in patches, as portions of it were found in the fæces.

The peritoneum was covered with spots of ecchymosis, and was of a purple hue.

The liver was enlarged, and easily broken up; its ducts contained a mixture of blood and pus.

The spleen was very much enlarged, abnormally dark in colour, and covered with spots of ecchymosis. The cells composing it stood prominently out, and gave it the appearance of having a large quantity of minute dots on its surface. On section, the whole of its texture seemed to be broken up—in fact, of all the organs of the body, the spleen presented the worst appearance, the disease evidently completely disorganising it.

The kidneys and bladder showed signs of intense inflammation. In the pelvis of the former there was pus, and in the latter a quantity of putrid urine, with peeling off of its mucous membrane.

The chest contained fluid. The lungs and pleura were ecchymosed, and the right lung was emphysematous. The trachea and bronchi were filled with mucus, with several petechial spots on the mucous membrane.

The heart was comparatively healthy. The pericardium contained an unnatural amount of fluid of a deep amber colour.

The lymphatic glands and ducts were enlarged and thickened, more especially those in the inguinal region, extending down the whole length of both hind legs, which, as I before mentioned, were swollen. On cutting into these swellings, the areolar tissue was loaded with a yellow serous infiltration.

The whole muscular system was flaccid, and very dark in colour; all the vessels running through and around the muscles were engorged with black blood, which no doubt gave them this peculiar hue.

On removing the eye from the orbital cavity, I found the pad of tissue on which it rests very much infiltrated. The vessels of the eye showed signs of intense inflammatory congestion.

3rd.—A Baywater mare, aged seven years, belonging to R.A. Duration of disease, fourteen days. Patient died a lingering death, after passing through every possible stage of the malady.

Post-mortem examination, thirty minutes after death, revealed, externally, great emaciation, with swelling of the head, between

the fore legs, and on the abdomen, extending to the mammæ, and also the extremities. There was black blood running from the mouth and nostrils, and from the vagina was oozing a stream of thick bloody urine. The fœtor from the body was simply beyond all description, so much so that it was with the utmost difficulty that I could get any one, either European or native, to assist me in the examination. Internally, every organ and tissue in the abdomen was in a state just bordering on putrefaction or septicity; the cavity itself contained a quantity of bloody serum.

The stomach and intestines were ulcerated; their coats black, thickened, and sloughing here and there in patches. Portions of detached membrane were found mixed with the fæces which the large intestines contained.

The capsule of the liver was easily detached, the organ itself much enlarged, and its structure softer than usual. The ducts contained bloody pus.

The spleen was half as large again as its normal size, highly congested, abnormally dark in colour, with complete disruption of its tissues.

Both kidneys had suffered much. Their surface was ecchymosed, and the cortical substance soft and flabby. The mucous membrane of the pelvis of the kidneys, ureters, and bladder, was ulcerated, and easily peeled off. The bladder contained a quantity of thick bloody urine streaked with pus. The walls of the vagina were much inflamed, and the labia swollen. The mammary glands were dropsical, and contained a large quantity of serous exudate.

In the thorax bloody serum was found, to the extent of about one and a half gallon. On the surface of the lungs and pleura at irregular intervals were blotches of extravasated blood, and they both presented a deep reddish-yellow colour. On section, the distinctive amber-yellow exudate was abnormally present, giving the parts quite a dropsical appearance.

The mucous membrane of the trachea and bronchial tubes presented a number of petechial spots, and were partially filled with frothy mucus, streaked here and there with blood.

The pericardium contained an abnormal amount of fluid, and was much discoloured, as was the heart itself. The right side

of the organ and all the large vessels were engorged with dark blood—in fact, the whole circulating fluid was of the same colour, whether an artery or a vein was examined.

The tongue was black and tumefied, the discoloration being worst towards the tip.

Vessels of the brain congested, but otherwise healthy.

On cutting into the swellings of the head and extremities, the tissues were found largely infiltrated with serum.

The lymphatic glands from the sublingual to the inguinal were enlarged and "knotty."

The hair of the mane and tail was coming out for some few days previous to death, but now it could be pulled out in large quantities without the slightest difficulty.

Remarks.—The extent of the morbid changes in the various tissues and organs of the body will depend much on the state of the patient's constitution prior to the attack, and the duration of the disease. For instance, if an animal has a diseased heart, liver, or lungs, you will find in such subjects that the disease has committed fearful ravages on one or other of these previously unhealthy organs; they are unable to perform the increased work thrown upon them, and ultimately break down, becoming the immediate cause of death.

Then, again, if an animal be in a debilitated condition when attacked, and although disease might not exist in any of the organs of the body, this class of subject will die in a very short time—in some instances a few hours—as the system is unable to weather it for any length of time. In such cases the morbid changes will be somewhat slight. There will be simply signs of intense inflammation having existed in every part of the body, the disease not having raged long enough to produce perceptible structural change.

Where the disease has been of long duration, you will find signs everywhere of organic decomposition—in fact, the whole of the body will be septic or putrescent to a greater or less degree.

Wherever there is a shut sac, or wherever there is loose and permeable areolar tissue, there you will find preternatural infiltrations, to a greater or less extent, of a yellow, dropsical-looking fluid. This dropsical condition of the various parts of the body

is no doubt brought about by the peculiar effect which the disease has on the absorbent system, and the consequent defective absorption it produces.

What may be termed the diagnostic *post-mortem* appearances in this malady are—the mal-oxygenated condition of the blood, and the presence of Bacteria in it; the peculiar amber-yellow tint which is imparted to the body, not like the yellow of Biliary Fever, but a distinctive colour of its own, which, when once seen will be always remembered; the condition of the spleen, and the intestinal ulceration.—*(To be continued.)*

NOTE ON A CUTANEOUS AFFECTION OF THE CAMEL.

BY C. CLAYTON, M.R.C.V.S., ROYAL ARTILLERY, KANDAHAR, AFGHANISTAN.

I AM forwarding some bottles, duly labelled, containing scrapings from camels and mules which are at present suffering from some affection, the nature of which I am not able, for want of proper means, to ascertain. This note, in case parasites are found, may be of some interest to dermatologists.

The disease is known by the natives as "Kharish"—a term generally made use of to designate all sorts of skin diseases, parasitical or otherwise. The camels—subjects of this communication—have just returned from their grazing-grounds, presenting all the appearances of Scabies, their bodies being partially denuded of air or wool, and covered in several points with superficial wounds, produced by the animals' teeth. The disease generally—the natives say invariably—commences on the inside of both thighs, from thence spreading to muzzle, head, neck, back, fore legs, and hind quarters. The natives, as with us before such complete studies and researches had been made, attribute the disease to neglect, over-marching under heavy burdens, indifferent feeding, irregular watering; but not—with or without reason, I cannot at present say—to any parasite, or, to use their own word, to any "janwar." The overseers, men of great practical experience, assure me the disease exists in all seasons of the

year among Afghan camels, as well as among those of Scinde, the Punjaub, or Biccaneer—in fact, wherever the following treatment is not adopted, there the troublesome affection will break out. This treatment must be applied early in March, and consists in administering to each camel, internally, one seer (or about two lbs.) of Taia-mira oil per diem for three days, and well rubbing into the whole surface of the integument one seer of the same. The period of treatment lasts about twelve days, during which full rations of ordinary food are allowed. The curative measures adopted in the lines are isolation of the affected beasts, and application every three or four days of a mixture of mustard oil (the only one procurable), phenic acid, and sulphur, in proportions varying with the intensity of the cases. Each dressing is carefully removed after the appointed time by means of warm water and soap; three or four dressings, in most cases, suffice to eradicate the disease.

The mules belong to the transport train attached to this column. The disease from which they are suffering is analogous to that already described, with the difference that it only exists along the back, loins, quarters, and superior part of ribs—in fact, only in points of the body with which the pack saddle comes in contact. I must state there has been no communication whatever between the two classes of animals, as the mules arrived from Quetta before the camels came into Kandahar. Out of 500 baggage mules, only twelve were found to have contracted the disease. The same treatment as indicated for the camels has been successful with these beasts. The drivers are free from any trace of the malady.

Where the hair has fallen away, the skin, when not wounded, is hard, dry, and furrowed between long prominent wrinkles. Marked uneasiness and great irritation exist, as proved by the frequent attempts of the animal to bite the affected parts, and the stamping—first of one foot, and then of the other, as if to shake off some unwelcome visitor. Loss in condition is most pronounced. A few days after the arrival of the caravan in camp, several of the camel-drivers were admitted into the base hospital, suffering from a disease of the integument, the exact nature of which has not been ascertained. I myself, on the

3rd of December, visited the camel-lines, when several native attendants complained of great irritation about their chests, back, ribs, abdomen, axillary regions, arms, etc. On examination of their bodies, I found the parts just enumerated covered with elevations, of various dimensions, of the same colour as the skin, and pierced at their summit by a small orifice, more easily recognised on some than others—depending, I should say, upon the amount of scratching which the unfortunates had indulged in.

[Scabies is not at all uncommon in the camel, and though the bottles alluded to have not reached us, yet there can scarcely be a doubt that the cutaneous malady referred to by Mr. Clayton was parasitic. As with the horse, ass, and mule, Scabies is an almost invariable concomitant of campaigning with camels, and was a most serious disorder among these creatures in the Crimea. The French army veterinarians in Algeria have made a careful study of Scabies in the dromedary and camel, and Wallon has published a good description of it in a monograph on the first-named animal (*Mémoires de la Commission d'Hygiène Hippique près le Ministre de la Guerre.* Paris, 1856). The parasite will exist on man. In 1841, M. Gervais discovered an acarus on a mangey dromedary which had recently arrived at the Paris Museum, and which communicated so severe a form of Scabies to the people who attended upon it, that the creature had to be destroyed. Mégnin has examined the itch insect of the camel, and pronounces it to be different in some important points to that of man and other animals, and designates it *Sarcoptes camelini.* He has since found it on the giraffe, llama, and dromedary; so that the form of disease is *Sarcoptic Scabies.* The furfuraceous ridged skin, and the subsequent scleroderma, were witnessed among the camels affected with Scabies in the Crimea.]

RETRO-PHARYNGEAL ABSCESS IN CATTLE.

BY CHARLES WHITWORTH, F.R.C.V.S., LONDON.

IN certain animals there is a predisposition to take on disease but here the exciting cause appears to be exposure to cold, etc

or may be connected with a strumous diathesis, which, however, now and again affects one or more cattle in a herd—from the fact that the patients have been exposed to the same unwholesome influences which operate upon similar constitutions—"shorthorns, to wit." The abscess is the result of acute or chronic inflammation locally manifested in the tissues about the pharynx, and which is insidious and perilous; impeding deglutition and obstructing respiration. The painful deglutition increases, until it is found that solids are refused and liquids regurgitated through the nose. Frequent spasmodic attempts are made to swallow, as if there was something in the mouth, sometimes with and sometimes without an augmentation of their natural secretion; unable or unwilling to swallow the abundant saliva, the patient allows it to dribble from its mouth. Although the act of swallowing is difficult and painful, we perceive on looking into the fauces no appearance which can account for these symptoms; yet, in the greater proportion of cases which have occurred, the morbid action has proved fatal.

Symptoms.—Roaring (audible at a distance); dysphagia; occasional rigors (indicative of suppuration); dyspnœa; marasmus; rumination suspended.

In 1872, at the request of Lord Brownlow, of Belton Park, Lincolnshire, I examined one of his most valuable short-horned bulls, which I certified to be suffering from a "retro-pharyngeal abscess," and that, in my opinion, death would terminate in Apnœa, unless tracheotomy was had recourse to, and that the crisis would be when he rejected his solid food.

However, ere their deliberations were mature, the bull died of Apnœa. I was present at the autopsy, which revealed the correctness of diagnosis. The abscess was large, contained more than a quart of pus; the walls were thick; other viscera healthy.

About a month later, on the same "farm," another shorthorn (a heifer in calf) showed similar symptoms, which animal I was requested to visit and report upon, when I proposed the following operation: to insert a tracheotomy tube, and then cut down into the parotideal region, puncture the wall of abscess, making a dependent orifice in the submaxillary space, and thereby discharge the contents of abscess; then pass a seton from above to below,

and treat as a common wound. The above operation was approved of, consequently I operated on heifer (instanter). Afterwards had her removed into a covered yard; gave her salines; allowed her nutritive and sloppy diet; the wound was dressed with carbolic dressings.

On the following day I visited her, when I found that she was ruminating, and that she had partaken of all the food that was given to her, and in the main appeared comfortable.

So far satisfactory; days, weeks, and months rolled on, when she was regarded, save her isolation (and that the tube required removing daily to be washed and reinserted and strapped round the neck, which the foreman soon learned to accomplish), as one of the herd. At this time the heifer was on full diet, ruminating and increasing in bulk, when an accident occurred.

It appears that the heifer was drinking at the trough, and in leaning over its sides, the water being low, she broke the strap which was attached to, and secured the tracheotomy-tube; the granulations, being exuberant at the orifice in the trachea, collapsed, ejecting the tube and plugging the orifice; when her respirations became accelerated, and the men at the farm alarmed and unable to find the tube (which had dropped into the trough), they sent for me, but unfortunately I was from home, when they resolved to cut her throat lest she might die ere I arrived.

In the same month of the same year, I was called in to examine two of the cattle the property of the Reverend Potchett, M.A., of Denton, Lincolnshire, which were suffering from the same condition. These animals were so emaciated that I considered it economy to slaughter and send them to the kennels, rather than to treat, which recommendation was accepted.

CASE OF PERITO-ENTERITIS, ASSOCIATED WITH CALCAREOUS DEPOSITS IN THE LIVER.

BY T. FLINTOFF, M.R.C.V.S., 8TH HUSSARS, AFGHANISTAN.

WHILST in camp at Basawal, Khyber Line Force, Afghanistan, I was called at 5.30 a.m., on the morning of the 12th April, 1880, to see a horse that was reported to be suffering from an attack of

Colic. I saw the case almost immediately, and found the animal in great pain, from what appeared to be Flatulent Colic, but what, on further examination, proved to be inflammation of the bowels, accompanied by Flatulence. An ordinary colic draught was given in the first instance, with no apparent good result. The tincture of opium in ounce doses, in conjunction with charcoal, was given repeatedly afterwards. Hot fomentations to the abdomen were tried, but the patient was too violent to admit of this treatment being continued, and an application of mustard was substituted; enematas were frequently given, and when I saw that the Flatulence did not disappear, I punctured the abdomen, about midway between the anterior spinous process of the ilium and the last rib, and about nine inches below the transverse processes of the lumbar vertebræ. But very little gas escaped, and the horse gradually sank and died about ten a.m. the same morning.

The *post-mortem* revealed extensive inflammation of the peritoneum and large intestines, with gangrene of the last-named viscus.

The liver was considerably atrophied, and presented a very unusual appearance; hence my reason for contributing this case to the VETERINARY JOURNAL. The surface was studded with very light straw-coloured spots, occupying about one-third of the visible space, and on making sections of the organ these light-coloured spots were found to pervade the substance of the organ.

I made a careful examination of the deposited matter, and found it to be of a calcareous nature, and in gritty masses about the size of an ordinary pea. I also placed a specimen under the microscope, and satisfied myself as to the exact nature of the deposits, which was as is above described.

The horse had frequently suffered from attacks of Colic for the last fourteen months, but I had never noticed any symptoms of liver disease accompanying the attacks. The visible mucous membranes had always presented a normal appearance, and after suffering from an attack of about two hours' duration, which was generally the length of time the attacks lasted, he used to appear quite well, suddenly regaining his spirits, and ready for work the next day.

I have no doubt that the Flatulent Colic from which the horse suffered so frequently, arose from the defective secretion of the liver, and to the same cause I attribute, indirectly, the termination in death.

The horse was sixteen years old, and had always kept his condition fairly well, and done his share of work with the other horses of the troop.

OVARIAN TUMOUR.

BY CAPTAIN RUSSELL, F.R.C.V.S., GRANTHAM.

On July 7th I was requested to attend a mare, the property of Mr. W. Moor, of Burton Coggles, which was said to be suffering from a severe attack of Colic and stoppage of the bowels.

The history of the case, as reported to me, was as follows:—The mare had started from home in the morning, in company with two others, to take some manure from one farm to another. On returning for another load, she was observed to be uneasy; presently showing unmistakable symptoms of Colic, she was removed to a stable, and two Colic draughts were administered at an interval of an hour or so; but the pain being continuous, I was sent for. On arrival I found my patient was a seven-years-old valuable cart-mare. The urgent manifestations of pain had somewhat abated, but the pulse numbered 84, and the temperature 104° F.; there was some trembling of the muscles of the hind extremities, with an anxious expression of countenance, and a certain amount of tympany. Examination *per rectum* discovered no trace of fæces, but great spasm of the rectum. After watching the case a few minutes, and making inquiries as to the nature of the food, etc., I administered a hypodermic injection of morphid and atropia combined, which had a very good effect; all pain ceased, and the mare ate a bran mash and a small quantity of hay, but the pulse did not alter. So I left some medicine to be administered at intervals, and returned home. I was aroused about 5.30 the next morning to see the mare again, as she had been suddenly taken very much worse. I found she had been perfectly quiet and free from pain from the time I left until five a.m., when the pain suddenly returned with great violence. I

found the pulse 100 to 110, temperature 104⅘°; expression of countenance very anxious; increased respiration; cold extremities; a good deal of general trembling, and increased tympany. Exploration *per rectum* showed matters exactly as on the previous evening, not a trace of fæces, and great spasm. The owner was persuaded it was a case of stoppage induced by overfeeding. I did not agree with him, as I felt persuaded it was a case of mechanical obstruction, the result of twisted intestines, or some other cause impossible to diagnose, but which a *post-mortem* examination would reveal. Seeing all efforts would be futile, I asked for a second opinion, as I could see my client was not altogether satisfied. Mr. Batchelder, M.R.C.V.S., of Grantham, at once kindly acceded to my request, and came over. We were unanimous that the case was one of an unusual character, and would terminate fatally. Everything was done to ease the pain and distress manifested by the animal, but without avail. A *post-mortem* examination revealed an ovarian tumour as large as a Dutch cheese, and weighing 7½ pounds, which had encircled the intestine at the commencement of the rectum.

Thinking this an interesting and uncommon case, I am induced to send it to the VETERINARY JOURNAL. I wish to add that about an hour before the mare died, we administered ʒvj. Hyd. chlor. in solution. Thirty hours afterwards some fowls were picking over the contents of the stomach and intestines, when two of them dropped dead. Had the chloral anything to do with their death? The only other drugs of a poisonous character used throughout the case were tincture of aconite in solution, and morphia and atropia hypodermically.

TUMOUR IN THE LATERAL VENTRICLES OF THE BRAIN.

BY L. BUTTERS, M.R.C.V.S., NORWICH.

ON the 21st June last, I was sent for at midnight to look at a bay mare, which was stated to be mad. I found the animal insensible to all external impressions, in a very wild state, and quite unmanageable. She was dashing about the box, the door and part of the wall of which she had broken down. I bled her

copiously from the jugular vein, after which she became a little quieter, when I ordered cold applications to the head. The next morning she was lying in a comatose state, and looked almost as if dead. I emptied the bladder by means of the catheter, morning and night, and also the rectum. She kept in this state until five a.m. on the 24th, when she got up. She could now micturate of her own accord, and I was able to administer a cathartic. She still took no notice of anything that was going on around her, and was quite blind, allowing the globe of the eye to be touched without her knowing it. The medicine operated well on the 26th and 27th, and I applied a blister to the forehead and poll. She kept on like this until July 1st, when I advised the owner to have her destroyed, as I believed there was a tumour in the brain.

On making a *post-mortem* examination, I found such to be the case—viz., a large tumour in each of the lateral ventricles attached to the plexus choroides—that in the left being rather more than three inches in length, and the one in the right about an inch. The large one was also attached largely to the corpora striatum. This is the fifth case which has come under my observation, two of which I described before the members of the Liverpool Veterinary Medical Association in 1873, and in all of them the symptoms were similar: one symptom being invariably present—viz., pressing the nose in a corner of the box, and keeping it firmly fixed in that position. In one case the animal lay in a comatose state for about a fortnight. The structure and appearance of the tumours were identical in all.

Charles Williams, Esq., F.R.C.S., of this city, on seeing the brain of the animal above described, was much interested in the specimen, and kindly made a microscopic examination of a section of one of the tumours, furnishing me with the result, which I have great pleasure in sending:—

"The right ventricle contained a tumour the size and shape of a turkey's egg; it had a smooth surface, and was firm to the touch, and had a dark brown colour, not unlike that of spleen.

"A small offshoot grew from its internal side, under the corpus callosum, into the left ventricle.

"On making a section of the tumour, its inner aspect presented

a number of yellow spots of various sizes, most of them being about the size of a pea. These were soft, and had the appearance of soft tubercle. On microscopical examination, these yellow spots were found to consist wholly of plates of cholesterine and oil globules. No tubercular material was to be seen. A portion of the tumour, when allowed to dry, shrivelled into a small lump of glistening scales—those of cholesterine."

POISONING BY STRYCHNIA SUCCESSFULLY TREATED IN THE DOG.

BY THE SAME.

ON the 13th March last, at six p.m., a large retriever bitch was brought to the infirmary suffering severely from the effects of strychnia, which she was supposed to have obtained by eating rat poison. The spasmodic contraction of the muscles was very severe, and threatened asphyxia at any moment. I immediately administered chloroform, and kept her under its influence for about an hour. I then gave Ext. belladonna, gr. xii. in sol. with ʒj. Tinct. opii., and continued administering the chloroform, only leaving off for short intervals, and occasionally giving hydrocyanic acid in 10-ɱ doses until nine o'clock. I then repeated the belladonna and opium. The spasms gradually became weaker and less frequent (in each of which I administered the chloroform), and at last ceased, leaving her very weak and lying down. In the morning I found she had perfectly recovered.

HYDRATE OF CHLORAL IN VETERINARY PRACTICE.

BY J. CAMMACK, M.R.C.V.S., CAPE TOWN, SOUTH AFRICA.

HAVING frequently received much benefit from the use of this drug in practice, I propose to give a few cases at some length, showing its generally useful application to veterinary purposes. Since I had the privilege, in 1871, of seeing it experimented with by direction of Professor Williams, of Edinburgh, it has been of considerable use to me as a mild anæsthetic in trifling cases, and

once or twice I think has been the means of saving life when other remedies had been used with an appearance of failure. From the ease with which a harmless dose will render an animal helpless and manageable, it is possible that most of our operations and manipulations, whether the throwing of the patient be required or not, will come to be preceded by its administration. Contraction of the voluntary muscles is suspended temporarily to a degree that varies with the dose, and possibly with the constitution of the individual, whether it be given by mouth or rectum, and this, in handling scores of horses, is a great advantage to the manipulator as well as owner; for, however muscular the patient may be, any possibility of "broken back" or thigh is obviated, and I believe that all the instances—and they are many—of these "operation" accidents are due to muscular contraction; for, so far as I am aware, they only occur in corn-fed subjects, which, from their value, are confided to the M.R.C.V.S., and not to the unqualified practitioner or mere castrator, when operations are required. Where hyper-sensitiveness and irritability render casting for trifles necessary, it acts instantly as a charm, especially in the horse, allowing painful wounds, etc., to be approached without resistance, the most vicious subjects becoming tame.

Case 1. Dutch cow straining violently after recent parturition. Give ʒij in water; remove placenta on cessation of straining, which takes place in five minutes and is not repeated.

Case 2. "Hysteria." A four-year-old mare, property of Mr. Twidale Scampton, Lincoln (England), having received purgatives, sedatives, diuretics at intervals, for thirty hours, getting worse and owner impatient, receives *per rectum* ʒij in large quantity of cold water: the frantic condition of animal having rendered further administration of fluids by the mouth next to impossible. In ten minutes the excitement of the animal, which has been of great interest in the neighbourhood of the stable in which she is standing, has disappeared. She calmly feeds for the first time since her seizure. Voids, frequently, small quantities of urine characteristic of the disease, behaving as if the act slightly irritated her. In about seven hours' time, while feeding, exhibits a return of the excitation by quickly moving the hind limbs as if

trotting. A dose of ʒvi. is given as before, with dispersion of the symptoms, which in ten hours again show themselves; she is easily startled, assumes a listening attitude, and screams—urine is still as highly coloured as at first. Give ʒiv, after which there is no further symptom of the hyperæsthesia. The administration of medicines in a liquid form was rendered safe by the action of the chloral.

Case 3. Pharyngitis. Seventeen days after attack, and twelve after apparant recovery, an aged Cape cab-stallion is unable to swallow. On attempting to explore mouth, though trachea has been opened, the animal will not tolerate the drawing forward of the tongue or opening of the mouth with or without use of the balling iron. Give ʒx chloral *per rectum*, and in a short time search mouth without casting; discover abscess, and puncture with canulated needle of hypodermic syringe.

Case 4. "Mad cow." Shorthorn cow, about six months in calf. Has been taken from grass and placed with others in a strawyard. Approaching her, she runs away with a startled aspect, then walks round intruders threateningly; has charged two or three persons, bellows considerably. Give ʒj every twelve hours, being in low condition; clothe and tie her up. There is visible alteration at once; gets well. There is reason to believe this case depended on indigestion; for, some months afterwards on her being fed on barley-straw, the symptoms, preceded by constipation, were again observed, and were removed after the use of doses of oil and linseed decoctions.

Case 5. An aged cow has had fits for three hours. Presents the appearance of strychnine poisoning, which owner thinks has probably taken place. Give, *per rectum*, ʒij in water; animal becomes calm, and I am enabled to give oil, *per orem*.

Case 6. Cart mare, an inveterate kicker; owner of a stallion refuses his horse's services unless she is drugged. A "wine-glassful" of laudanum was once given her, and rendered her "a thousand times worse." Object attained by one dose of chloral.

In conclusion I will mention the only case where I have seen the slightest reason to suspect bad effects from it, and in this case it was given in a condition so undiluted as to be irritating,

if not positively caustic, and probably before a correct diagnosis had been arrived at.

Case 7. Am called out of bed to a horse with "stoppage of the water." Subject proves to be an aged coach-horse, in low condition, with severe abdominal pain. Consider it a case of spasmodic colic; give, as I had frequently before, and often have since, ʒiv chloral, but by misadventure seize a four-ounce bottle containing four ounces chloral in solution; pour the whole into a soda-water bottle, fill up with oil, and proceed to administer. There is quickly an inability to swallow, with a flow of saliva; but I persevere, desisting only when he reels and staggers from the development of the physiological action of the drug. I discover the error, and guess he has swallowed about three ounces of it. See him again in six hours, and owner approvingly says "it was a good strong dose, for it made him very drunk, and vomit like a pig in ten minutes after he had it." He has now a pulse of 70, abdominal pain on swallowing only, whether fluids or solids. Dies in forty hours after reception of the "remedy." The membrane of the pyloric region of stomach is slightly reddened, sub-mucous tissue unfiltrated, small bowels healthy, colon is inflamed, and there is extensive Peritonitis.

Editorial.

THE GENERAL EDUCATION OF THE VETERINARY SURGEON.

A SUBJECT of perhaps equal moment with the professional education of the veterinary surgeon, is that of his general education; and its importance is evidenced by the considerable amount of attention directed to it on the Continent, where, notwithstanding the already comparatively high standard at which the matriculatory examination of the veterinary schools has been fixed, a still higher test is sought to be imposed.

In this country, until quite recently no educational test whatever was applied to candidates for admission to our schools, and the illiterate were admitted as freely as those who possessed a fair amount of general knowledge. We have already given the reason for this, and we need scarcely refer to the result. No one who has studied the history of veterinary medicine in these kingdoms, and kept his eyes and ears open for proofs of the effect of this neglect, will for a moment attempt to deny that defective general knowledge has been as great a barrier to advancement as imperfect professional education. Indeed, if we

were asked what has kept the profession for so many years in such an inferior social position, we would unhesitatingly say that it was the low standard of education—the illiterateness—which the public associate with the designation or calling of veterinary surgeon. We are continually complaining of our inferior or degraded status, and are only too ready to blame the public for its non-recognition of us as men of science—as professional men; or we seek everywhere for the cause except in the right quarter. We may rest assured that if we have failed to be recognised as men of education, as men of science, it is simply our own fault: we have not striven to be either the one or the other. When we are fitted to assume the position to which we aspire, and which we are never tired of accusing outsiders of denying us, it will readily be accorded. We have put such a slender value upon our profession: we hold it, apparently, in such insignificant regard, that we not only allow every ignorant impostor to assume our title, but we permit men to enter our ranks who are unfit to represent us before the public with whom they come in contact—men who can only bring disparagement upon the branch of medicine they have been allowed to adopt. It is true that, for the last few years, the schools have carried out, or tried to carry out, a matriculation examination; but to those who have watched the result, it must have appeared anything but satisfactory. While at one school the standard of general education may have been placed decently high, and the test honestly applied, there is only too glaring evidence to show that at another it must have been exceedingly low, or the test has not been fairly imposed. Where we have private competing schools, struggling to live, and not very scrupulous as to how they may obtain the wherewithal to exist, this will be the case, and the school which shirks the duty of exacting proof of a moderate degree of knowledge from the candidates who seek admission to its benches, will probably do so from the notion that it can admit those who fail to enter, or dare not claim entrance to the schools which demand this proof.

Without a good education, students cannot be supposed to understand the subjects they are called upon to inform themselves, to comprehend the objects of their study, or to profitably follow their teachers, whose labours are greatly increased and their lives harassed by having to do with pupils who are mentally incompetent to receive their instruction. And without a good general education the practitioner will rarely be able to accomplish much either for himself, for his profession, or for his country. We have but to look to our own annals during the last eighty years for a justification of this assertion.

It has been stated by some persons that veterinary surgeons do not require to be highly educated; and, indeed, that education is rather a drawback to the student of veterinary medicine. Such a statement is as destitute of proof as it is of sense. Members of the veterinary profession should be as well educated, and as competent to assume a respectable position in society, as medical men, and until they are so it is useless lamenting or scolding at our ill-fortune. Some modest individuals think that country practitioners need not be educated men—in fact, that anybody is good enough for the country. We do not at all share

in this opinion, but assert that veterinary surgeons everywhere should be educated men, and that owners of animals who chance to reside in the country have as much need and right to the services of well-informed practitioners as those who dwell in towns. We do not find the Royal College of Physicians or Surgeons making any distinction with regard to graduates for cities, the army, or the country. Veterinary medicine is the same, whether practised in London or the wilds of Wales, and demands the same amount of skill and intelligence in town and country.

Without a fair amount of general education we can make no progress, but must retrograde. Education is now so common and so cheap, that it is placed within reach of the very humblest. Surely it is not too much to ask that graduates of the Royal College of Veterinary Surgeons shall be as well educated as a grocer's apprentice or a draper's assistant, and that they shall possess a reasonable acquaintance with the proverbial three R's. It is only too evident that they will never do so under the present system; and as the Royal College is responsible to the profession and the public that those who obtain its diploma are in every respect qualified to assume and maintain the position which that diploma should confer, it will most certainly fail in its duty if it does not take steps to ascertain whether those who apply to become members of our corporation are so educated, generally and professionally, that the reputation of veterinary science, and the welfare of the country, will not suffer at their hands.

The strength of a chain is that of its weakest link. Our weakest professional link is at present that of education, and until we have made it one of the strongest it is simply nonsense, or something worse, for us to claim to be a learned and scientific profession.

INDIVIDUAL VARIATION IN EQUUS ASINUS.

In a paper contributed to the proceedings of the Zoological Society of London for January of this year, Mr. J. H. Steel, M.R.C.V.S., points out some interesting and notable variations he has observed in the asinine species. These individual variations he finds more especially in the vertebræ, bones of the limbs, several of the muscles of the head, neck, trunk, and legs, as well as in the viscera and blood-vessels. The observations are valuable, not only from an anatomical, but also from a zoological point of view, and are evidence of great attention and close comparison in the dissecting-room.

THE BELGIAN VETERINARY CONGRESS.

As announced in our last issue, a National Veterinary Congress was held in Brussels on July 8th, 9th, 10th. This year being the fiftieth anniversary of the independence of Belgium, Brussels has been *en fête* for some time, and several congresses of scientific men, humanitarians, and social economists have marked the memorable occasion. That of the veterinary profession was a great success. Under the patronage of the King, opened under the auspices of the Minister of Agriculture, and its expenses to a great extent met by a public grant, it could not prove anything but a success, especially

when its objects met with not only the approbation of royalty, but also the support and enthusiasm of the entire body of the profession in Belgium. Delegates were also present from Germany, France, Holland, and other countries, as well as England—the latter being represented by the President of the Royal College of Veterinary Surgeons, Mr. Fleming.

The business of the Congress was conducted in an excellent manner, under the able presidentship of Professor Thiernesse, Director of the National Veterinary School at Brussels. Five subjects were discussed, and progress was greatly facilitated by each of these having been allotted to a competent member of the profession, who wrote a *rapport* on it. This was printed and distributed among those who had signified their intention to be present, some days before the Congress met; so that at the meeting the discussion of each subject was commenced at once, those who joined in it being fully prepared, through having leisurely studied the *rapport;* therefore no time was lost. The discussions were well maintained, and each resolution was supported or opposed with all the energetic eloquence which distinguishes our Continental colleagues. The meetings of the Congress were held in the splendid new town hall of the Commune of Anderlecht, in which the veterinary school is situated. On the second evening of the Congress, the members enjoyed the hospitality of the municipality of Anderlecht at a *rôout*, which was enlivened by the excellent band of the *Garde Civique*, and the presence of the officers *en grande tenue*. The Congress terminated with a splendid banquet at the restaurant of the Palais de Bourse, and at which toasts came fast and in abundance. The purport of the first toast, that of the King, was telegraphed to the Royal Palace at Laeken, and received a gracious response. The foreign delegates could have but one opinion as to the generosity, amiability, and friendship displayed towards them by their Belgian *confrères*, who spared no pains to impress upon their visitors that there is a professional brotherhood which recognises no nationality. Personally we tender our warmest thanks to the Director and professors of the Cureghem school, and to our army *confrères* and colleagues in civil practice in Belgium, and we earnestly hope that the high position they already occupy in royal and public estimation may be still further heightened when the results of the Congress become known. A well-educated and scientific body of gentlemen, the veterinary surgeons of Belgium are well worthy of the confidence reposed in them and the esteem in which they are held.

PELVIC HERNIA IN THE OX.

In the *Thierarztliche Mittheilungen*, Lohrer draws attention to what he calls "internal hernia," or "internal abdominal hernia," which appears to be somewhat frequent in Germany. During forty years' practice, Lohrer had only observed this accident in male oxen which had been castrated. It always consists in the passage of a knuckle of intestine through a rent in the fold of peritoneum extending between the spermatic cord and the roof of the pelvic cavity, when strangulation occurs. The animals were generally from eight months to five years old, and the hernia occurred on either the right or left side, sometimes on both sides in the same animal. The oxen had all been castrated early, and Lohrer is of opinion that the operation is a predisposing cause, from undue traction on the spermatic cord during emasculation, whereby the peritoneal duplicature is torn; or the spermatic cord may form adhesions in the inguinal canal by its cut extremity, and so producing exaggerated tension on this peritoneal fold, render its laceration more easy and likely to occur. Or it may be that the adhesive inflammation which immovably fixes this extremity of the cord, offers a serious obstacle to its

further development, and that during the general growth of the body and the increase in every direction of the pelvic cavity and the organs it contains, the cords which were at first relaxed and flaccid gradually lose their curvilinear direction, become tense, and pass obliquely downwards, forwards, and outwards, to the anterior part of the pelvis. The peritoneum surrounding the cord evidently submits to the same degree of tension, and if the abdominal viscera happen to press more than usual on this thin septum, they may cause its rupture, and so penetrate the pelvic cavity. The accident may happen in various ways, as when the animal is ascending a steep path, jumping on its companions, or standing in a stall with a very sloping floor.

When the laceration takes place in oxen more than two years old, the intestine does not immediately pass into it, this depending upon a combination of circumstances.

The principal symptoms are frequent Colic, Anorexia, constipation, and a straddling position of the posterior limbs. Exploration *per rectum* confirms the diagnosis, as extreme tension of the spermatic cord is felt on the side where the hernia is situated.

Various measures have been adopted for the relief of the animal—such as simple taxis *per rectum;* rupture of the cord through the wall of the rectum, or its section after perforation of the rectum ; or release of the strangulated intestine by an opening made at the flank Lohrer gives preference to the latter, and he was always successful in saving his patients when no more than thirty hours had elapsed since the appearance of the first symptoms of the hernia.

THE COMPOSITION OF COWS' MILK IN HEALTH AND DISEASE.

A FEW months ago we announced that Dr. Wynter Blyth, analyst for Devon, was about to undertake some investigations into the composition of cows' milk in health and disease, and we expressed the hope that those veterinary surgeons who had the opportunity would assist, by sending him small quantities of milk from diseased animals. Dr. Blyth has now published the result of his researches, so far as they have extended, and we are glad to find that he has received some aid from our colleagues, Messrs. Gray (Bakewell), and Penhale (Barnstaple). From the pamphlet just issued by Dr. Blyth we extract the following interesting information.

Quantitative Estimation of the different Constituents of Milk.

With regard to the total solid constituents of milk, the amount of milk-fat, the ash, and the percentage of what has been termed *solids* not fat, there is nothing new to offer, some thousands of analyses having definitely settled, as much as a matter of the kind can be settled, the general and average proportions of those substances.

But it may be remarked that the analyses of the analysts, as well as those of physiologists, only exceptionally show any determinations of the "albumin," and very erroneous statements have been made with reference to the percentage of albumin in milk.

It appears from my numerous analyses to vary as a rule within, comparatively speaking, small limits, and therefore should be more frequently estimated. The highest amount I have hitherto obtained was from milk derived from a healthy Devon cow, in which it reached 1·345 per cent.

The lowest, in a cow suffering from Phthisis, 0·320 per cent.

In over 90 per cent. of the milk from healthy cows, the percentage of albumin varied from 0·5 to a little under 1 per cent., the mean being 0·77 per cent.

Similarly the highest determination of casein was from a Guernsey cow, the highest being 4·8 per cent. The lowest, from a cow suffering from Phthisis, 2·9 per cent. The average amount of casein in healthy cows' milk appears to be very nearly 4·00 per cent.

The following table gives as complete a view of the relative proportions of the different bodies in cows' milk as at present is possible.

Average Composition of Healthy Cows' Milk.

			Parts per cent. by weight.
Milk-fat ...	Olein	1·477	3·50
	Stearin and Palmitin ...	1·750	
	Butyrin	0·270	
	Caproin	0·003	
	Caprylin and		
	Rutin		
Casein			3·98
Albumin			0·77
Milk-sugar			4·00
Galactin			0·17
Lactochrome			undetermined
Bitter principle (glucoside ?)			0·01*
Urea ... ... traces, such as ·0001 per cent. nearly always present.			
Creatin ... ... traces (Commaille).			

			Parts per cent. by weight.
Ash ...	K_2O	0·1228	0·700
	Na_2O	0·0868	
	CaO	0·1608	
	Fe_2O_3	0·0005	
	P_2O_5	0·1922	
	Cl	0·1146	
	MgO	0·0243	
Water			86·87

Milk from Diseased Cows.—If the idea should be in part or wholly true that Consumption and similar maladies may be transmitted to man by the ingestion of milk from diseased cows, some method, whether physical or chemical, of distinguishing such milks becomes of the most vital importance. I have unfortunately had but few opportunities of working at this subject, but so far as the analyses to be quoted go, they rather appear to show that a cow even suffering from very acute disease may give milk differing in no essential feature from normal milk; while on the other hand, trivial and severe local affections of the udder, characterised by bloody or purulent discharges, are easily to be recognised, by the presence of such products in the milk.

Mammitis.—A Heifer, second day after Calving, suffering from Acute Mammitis.

Sp. gr. 1·0362.	In 100 c.c.
Milk-fat	2·800
Casein	4.025
Albumin	0·560
Milk-sugar...	5·541
(Nitrate of mercury precipitate dried at 100°	1·68)†
Ash...	0·920
NaCl in ash	0.920

* Mean of four determinations only.

† At the time of the analysis the compound nature of the mercury precipitate was not known.

The microscopical appearances did not differ in any essential feature from milk derived from cows having recently calved.

Parturient Apoplexy.—A Cow suffering from Parturient Apoplexy; Pulse Imperceptible, Temperature 99·4°. Third day after Calving.

Sp. gr. 1·037. Reaction feebly alkaline

	In 100 c.c.
Milk-fat	3·750
Casein	4·025
Albumin	1·145
(Weight of mercury precipitate	1·38)*
Ash	0·980
NaCl in ash	0·102

Urea was absent; there was much lactochrome. No abnormal elements detected by a microscopical examination.

The Milk of a Cow suffering from Pneumonia, fourteen days after Calving. Pulse 82, Temperature 102·4°.

Sp. gr. 1·0297.

	In 100 c.c.
Milk-fat	2·965
Cholesterin	0·580
Casein	3·860
Milk-sugar	3·880
Albumin	0·430
Galactin	0·090
Urea	0·005
Ash	0·800
NaCl in ash	0·488

This is the only milk in which I have found cholesterin. The microscopical results were negative.

Engorgement of Rumen and Congested Liver. Pulse 68, Temperature 101°.

Sp. gr. 1·032.

	In 100 parts by weight.
Milk-fat	6·057
Casein	4·796
Albumin	1·067
Milk-sugar	4·497
Galactin	0·113
Ash	0·670
NaCl in ash	0·092

The milk appears simply concentrated.

Phthisis.—A Cow five years old, with Extensive Tubercular Deposit in Right Lung. The Dam was also Scrofulous.

	Dec. 7, 1878.	Feb., 1879.
Sp. gr.	1·0297	1·0340
	In 100 c.c	In 100 c.c.
Milk-fat	2·77	3·83
Casein	3·650	5·4
Albumin	0·867	0·365
Milk-sugar	2·824	3·34
Alkaloids	?	?†
Ash	0·865	0·770
NaCl in ash	0·096	0·15

* At the time of the analysis the compound nature of the mercury precipitate was not known.

† The determinations of galactin were made on so small a quantity as not to be reliable, but this is certain, that the galactin was beyond the average.

A careful microscopical examination could detect no abnormal elements.

Phthisis.—A Cow, two years old, in an advanced stage of Phthisis.

	Jan. 29.	Feb. 17.
Sp. gr.	1·0329	1·0335
	In 100 c.c.	In 100 c.c.
Milk-fat	2·599	3·280
Casein	3·000	3·980
Galactin	?	0·250
Milk-sugar	2·888	4·100
Ash	0·910	0·780
NaCl in ash	0·10	0·15

The entire amount the cow yielded in January was one gallon; the amount sent to me was a fractional part of the whole.

A Sample of Milk drawn from an Udder actually Infiltrated with Tubercular Deposit.

Sp. gr. 1·018.

	In 100 parts by weight.
Water	94·640
Casein	1·210
Albumin	2·387
Milk-sugar	0·470
Milk-fat	0·490
Alkaloids	absent
Urea	0·0·9
Ash	0·764
NaCl in ash	0·430
Nitric acid in combination	0·018

The whole quantity of the fluid did not exceed 70 c.c. It was of a dirty amber colour, with the casein partially separating.

A microscopical examination showed very few fat-globules, and the following abnormal elements :—

1. Clusters of oval or round granular cells, for the most part ·0005 inch in diameter, with a well-marked oval nucleus.

2. Granular masses, irregular in shape, varying in size from about 0·0006 inch to ten or twelve times that size.

3. Granular rounded bodies, stained brilliantly by magenta or carmine.

This, then, is phthisical milk in its most intense form, and one never likely to be found in commerce, but admixture of such a fluid with genuine milk is possible.

It is essentially an albuminous serum, containing urea, small quantities of nitrates, common salt, and just sufficient casein and milk-sugar to show its origin from a much-diseased milk-gland. The absence of alkaloids is noteworthy.

Local affection of the Udder.—Milk from a Heifer two days after Calving, suffering from retention of Fœtal Membranes, a portion of the Udder much inflamed.

The milk was pink in colour, and contained about a twentieth of its bulk of blood; it was perfectly fresh when examined, but rapidly putrefied. The blood was separated by subsidence as much as possible. The reaction was feebly acid :—

Sp. gr. 1·0313.

	In 100 c.c.
Milk-fat	4·40
Casein and Milk-sugar	9·81
Albumin	0·62
Galactin	0·269
Ash	1·16

ON LAPAROTOMY AND THE PRINCIPAL OPERATIONS SUBSEQUENTLY PRACTISED ON THE ABDOMINAL ORGANS OF THE DOMESTIC ANIMALS.

Professor Degive, of the Brussels Veterinary School, and corresponding member of the *Académie Royale de Médecine de Belgique*, has published, in the *Bulletin* of that society, an excellent paper on Laparotomy, which has been republished in the *Annales de Médecine Vèterinaire* of Belgium, for January of this year. From a surgical point of view, the article has a special importance of its own, and as the subject is somewhat novel, from the manner in which Degive treats it, while its importance is great, we make no apology for giving a translation of the paper *in extenso*.

IT is known that the term *Laparotomy* is employed to designate the operation which consists in opening the abdomen with the object of acting directly on one or other internal organ. The term is derived from two Greek words—λαπαρη, *flank*, and τομη, *section*. It therefore signifies, properly speaking, *incision of the flank*. It is in this restricted sense that it is to be considered in the course of the observations which follow.

Up to the present time, French authors have continued to apply the name *Gastrotomy* to this operation, and the majority of them seem to be ignorant of the existence of such a denomination as *Laparotomy*, which is older and more appropriate.* No doubt the term *Gastrotomy* serves better to designate *opening the stomach*, and it would be desirable, it appears to me, to employ it in no other sense; for then there would no longer be any possible confusion, and we should possess two different terms to denominate two very distinct operations—*incision of the abdomen*, and *incision of the stomach*.

Incision of the flank is practised with various objects in view. Among the most important may be enumerated: ablation of the ovaries; extraction of the fœtus; removal of foreign bodies arrested in, or introduced into, the abdominal and gastro-intestinal cavities; artificial alimentation; the reduction of intestinal invagination, volvulus; internal hernia; reposition of the uterus in those cases of torsion which are irreducible by ordinary means; the extirpation of various neoplastic productions developed either in the abdomen itself, or in some organ contained therein, etc.

After this simple enumeration, we can see how numerous and varied are the indications for Laparotomy, and we may also judge as to the value of this operation if it can be rendered efficacious in the majority of cases in which its employment is justly invoked.

If veterinary literature is consulted, it will be at once remarked that Laparotomy has not yet taken its place among the classical operations, and that, in addition, the number of those who have resorted to it up to the present time is relatively very limited. To open the abdomen, to incise the flank of an animal in order to reach the intestine, uterus, or any other organ, is for the greater number of veterinary surgeons an operation of such a serious character, that it would appear to them to be the height of temerity to undertake it, even in those cases in which it is most indicated, and in which it might yield the best results.

To judge by my own observations, and by everything which, so far as I know, has been published on the subject, nothing can be more unfounded than this injurious belief, which is unfortunately too widespread, as to the dangers incurred by *incising the flank*. To show how the gravity of the operation has been exaggerated, and to point out what are the conditions which are required to ensure success, is the object that prompted me to un-

* So long ago as 1837 there was published at Bonn a memoir on Laparotomy, by Dr. Stachelhausen. It is difficult to understand why so clear and precise a term has been so long in taking its place in French literature.

dertake the task I have the honour to submit for the consideration and appreciation of the Academy.

This study occupies two parts. In the first I shall consider Laparotomy in itself, and independently of the special indications to which it should respond; and the second is devoted to a succinct description of the principal operations in which Laparotomy constitutes the first.

I.—Laparotomy Considered in a General Manner.

It is difficult to fix the period when *incision of the flank* was first practised upon the domestic animals. The origin of *Laparotomy* is necessarily confounded with that of special operations (ovariotomy, hysterotomy, gastrotomy, etc.) to which it is a kind of indispensable prelude. In studying these, I shall have occasion to allude to what is most important to note relative to this subject.

Like every other serious operation, Laparotomy began to exist for a certain time as a mere conception. Indeed, if we turn over the pages of history, we shall see that different authors have commenced to make allusion to it as something possible, and they even recommend it in those extreme cases when there is no other chance of saving the patient. After these writers come others, who, less timid and more appreciative of acquired facts, have had the fortunate audacity to take the first step in a path which promised to become more and more beneficial. When they saw that penetrating abdominal wounds of apparently the most serious character were not fatal, they no longer feared to lay their hand, armed with the bistoury, upon organs whose susceptibility had been evidently exaggerated, and their physiological resistance mistaken.

I.—*Indications and Contra-Indications.*

Before undertaking an operation, it is above all things necessary to decide as to its economic value, and to determine the circumstances in which it may be advantageous or disadvantageous to perform it. What, then, are the cases in which Laparotomy may be beneficially resorted to? To arrive at the solution of this question, it is first essential to be assured as to the degree of danger of the operation.

It is evident that the mere fact of opening the abdomen does not offer the same degree of gravity in all the species of domesticated animals. Generally benignant in the smaller creatures, it is apparently exposed to more serious consequences in the larger species, and particularly the equine. But however this may be, I believe it is permissible to state, in general terms, that *opening the flank presents, in itself, little danger in the domestic animals.* The truth of this thesis is sufficiently established by the facts now acquired by clinical observation and experimentation. Among these facts, I may cite those which appear to me of most value; and in doing so I shall classify them according to their character, and in the chronological order of their publication.

A. *Abdominal Wounds.*—1. *Penetrating wound of the abdomen of a horse.* By *M. Gaullet.** Escape of a considerable portion of the intestines, and laceration of the great colon to an extent of two inches. Treatment—which was not resorted to until some time after the injury—visceral and parietal sutures. Recovery.

2. *Penetrating wound of the abdomen of a horse.* By *M. Guillmot, of Havelange.*† Protrusion of an extensive portion of the small intestine for about seven hours; marked engorgement and injection of the protruded portion; reduction by enlargement of the wound; parietal suture. Recovery in a month.

* Recueil de Méd. Vétérinaire, 1832, p. 591.

† Journal Vétérinaire et Agricole de Belgique, 1845, p. 203.

3. *Penetrating wound of the abdomen, with perforation of the intestine of a horse.** By *Professor Rey*, of the Lyons Veterinary School. Recovery, notwithstanding acute consecutive Peritonitis.

4. *Contused wound penetrating the abdomen of a horse.* By *M. Leblanc.*† Considerable hæmorrhage; an accumulation of altered fluid in the peritoneal cavity. Parietal suture; counter-openings near the umbilical region. Recovery.

5. *Eventration in a horse, complicated with laceration of the large intestine.*‡ By *M. Guilhem.* The hernia was as large as a child's head; the laceration measured four inches in length. Visceral and parietal. Recovery in a month.

6. *Eventration of a mule three months old.*§ By *M. Nicoleau.* Irregular and lacerated wound five or six inches long, and about two inches wide; protrusion of about twenty-five inches of the small intestine. Reduction three hours after the accident; very little fever. Recovery after three weeks' treatment.

7. *Several cases of eventration, with laceration of the intestine of a horse. Recovery.*‖ By *Bampfield Kettle.*

8. *Eventration in a pony.*¶ By *M. Taylor.* Reduction effected the day after the accident; application of a double parietal suture and a bandage around the body. Recovery.

B. *Intestinal Invagination.***—9. *Volvulus or intestinal invagination in the bovine species.* By *Luscan.* The author reports having operated on the seventh day. Opened the right flank; reduced the invaginated portion; ordinary parietal suture. Recovery after fifteen days' treatment.

10. *Invagination in a cow successfully treated.*†† By *M. J. Meyer.* On a cow suffering from invagination, Meyer first incised the right flank and brought the invaginated portion outside the body. Being unable to effect reduction, he decided to excise the entire mass, which was becoming gangrenous, and was estimated to measure about six feet of intestine. The amputation having been effected, the two ends of the tube were united by a suture to be described immediately. The cow recovered in a short time. In about six months it brought forth a healthy calf, and was afterwards kept for several years as a good milch cow.

11. *A case of intussusception in the cow; opening the abdomen on the third day; manual de-invagination. Recovery.*‡‡ This case was observed by myself in August, 1870. The animal suffered from Colic for three days, and the administration of several purgatives was without result. Rectal exploration enabled me to distinguish the presence of the *tumour* characteristic of *invagination.* I incised the flank in the usual way, brought out the intestine, and succeeded, though not without much difficulty, in effecting reduction of the invaginated portion. I applied a double suture—muscular and cutaneous. In three weeks the animal was radically cured.

C. *Internal Strangulated Hernia in the Ox. Dilatation effected by passing the hand through an opening made in the middle of the flank.*—12. Besides

* Journal de Médecine Vétérinaire de Lyon, 1851, p. 496.
† Recueil de Médecine Vétérinaire, 1853.
‡ Journal des Vétérinaires du Midi, 1855, p. 17.
§ *Ibid*, 1855, p. 350.
‖ *Ibid*, 1856, p. 228.
¶ Journal des Vétérinaires du Midi, 1858.
** *Ibid*, 1841, p. 41.
†† Recueil de Méd. Vétérinaire, 1863, p. 697.
‡‡ Annales de Médecine Vétérinaire, 1870, p. 633.

several cases recorded by Zundel,* Hering,† I will only particularly notice one by Vine, in which a cow had suffered from violent Colic for twenty-eight hours. Eight days after the operation the animal had completely recovered.‡

D. *Foreign Bodies in the Digestive Canal. Direct extraction by flank incision.*

13. *Foreign bodies contained in the second compartment of the ox's stomach.* Two cases successfully operated upon by Obich, a Bavarian veterinary surgeon,§ and another by Schavarz, of Landeau.‖

14. *Voluminous intestinal calculus in a horse.* Laparo-enterotomy was practised in this instance by Felizet, senr., of Elbœuf.¶

15. *Concretions in the intestine of a dog.* Several recoveries obtained by the same operation by the same authority.**

E. *Torsion of the Uterus in the Cow.* Reduction by incision of the right flank.

16. Six successful cases reported: one by Epple, of Constat;†† another by Heichlinger;‡‡ three by Obig, of Straubing;§§ and one by Santichi, of Castiglione.‖‖

17. After describing the manner in which he operates in different cases, Diccas, of Neustadt, adds that he has never observed any troublesome accidents supervene. It is to be regretted that he does not give the number of cases in which he operated.¶¶

If to this long list of facts*** we add:

1. The usual innocuousness of castration of females of the smaller species and of the cow by flank incision;

2. The very satisfactory results given by castrating females of the larger species *per vaginam;*

3. The almost constant success attending castration of the cryptorchid horse by a large dilatation of the inguinal canal;

4. The ordinary innocuousness of gastrotomy in the bovine species;

5. The success recorded as following Cæsarean section in the cow (4 cases†††), in the bitch (5 cases‡‡‡), and in the sow (1 case);

6. Three cases of castration of cryptorchid horses, successfully performed by opening the flank (Serres, Barfœd, and Hoyer);

7. The usually successful results attending several experimental operations—such as *gastrotomy* in the dog, and *extirpation of the spleen* in the goat, dog, etc.—if we consider all these facts, we shall have superabundant proof as to the truth of the argument I have advanced, *that Laparotomy, in itself, is an operation attended with but little danger in the domestic animals.* But I must repeat *in itself*, in order to meet the objection which may be at once

* Dictionaire de Méd. et de Chirurgie Vétérinaire.
† Recueil de Méd. Vétérinaire, 1863, p. 267.
‡ *Ibid*, 1859, p. 285.
§ Journal des Vétérinaires du Midi, 1864.
‖ Annales de Méd. Vétérinaire, 1871.
¶ *Ibid*, 1877, p. 442.
** Journal de Méd. Vétérinaire de Lyon, 1853, p. 40
†† Annales de Méd. Vétérinaire, 1870, p. 345.
‡‡ *Ibid, loc. cit.*
§§ Journal de Méd. Vétérinaire de Lyon, 1870, p. 533.
‖‖ *Ibid.*
¶¶ Annales de Méd. Vétérinaire, 1868, p. 108.
*** We could enumerate many more instances than are referred to by M. Degive. Those to be found in English veterinary literature are, except in two cases, overlooked.—Ed. *V. J.*
††† Journal Pratique de Méd. Vétérinaire, 1826, p. 221.
‡‡‡ Annales de Méd. Vétérinaire, 1878, p. 241.

offered to this argument; for the success attending Laparotomy has been uniform, though the operation and its analogues have also their passive aspect, which it would be wrong not to take into account. I know that Laparotomy has not always been crowned with success, and I do not deny that the operation reckons on its passive side a certain number of failures which it would be unfair to ignore. But it may be asked what signification need be accorded to them, in the presence of the character, the number, and the importance of the facts just alluded to. Considering the latter, might we not admit that if the results of Laparotomy have not always been favourable, this is to be ascribed to particular circumstances to which the operation, *per se*, is completely foreign.

Three principal circumstances may lead to the non-success of Laparotomy: a vicious operative procedure, an unfavourable state of health of the patient, or bad hygienic conditions in which it may be placed after the operation. Appreciating all the importance of these three conditions which militate against success, the operator should do all that in him lies to obviate them. When I come to treat of the operative procedure, I shall endeavour to indicate the precautions to be adopted in order to ensure success. For the moment, I will confine myself to insisting on one feature which appears to me to have a capital importance in an economical point of view with regard to Laparotomy: this is that when the operation is once judged to be useful, it should be decided upon and resorted to with celerity, as temporising may lead to the most serious consequences. As some time has elapsed before the practitioner is called in to see such cases, when he has decided, the patient and the organ are weakened and spent, and alterations have taken place; so there is no longer the necessary strength left to withstand the shock of surgical interference. How many patients have succumbed to the results of various operations of the same kind, and yet who would certainly have survived if there had not been temporising and hesitation? Better to abstain from operating, than to operate too late.

But to resume, I repeat that in my opinion Laparotomy has been, and is now, generally judged too severely; that in itself it does not offer anything serious for those animals which are considered as most likely to develop Peritonitis—particularly those of the equine species. I have given all the principal cases in which Laparotomy may be usefully resorted to.

In all these cases there is the indication to resort to it as soon *as it is recognised that, without this operation, the patient must almost certainly die.*

I confess I do not understand the conduct of certain *confrères* who, in presence of an *accouchement* deemed impossible, internal strangulation, or an intestinal obstruction which resists ordinary measures, declare that they have exhausted their skill and that death must ensue, when by resorting to Laparotomy they might perhaps ensure the best results. This conduct is blamable in every respect; and even when one hesitates to undertake the operation alone, has he not always the option of demanding a consultation with a colleague, and sharing with him the responsibility of the unfavourable consequences which the operation may give rise to?

The operation being decided upon, it remains to execute it in the best manner. In order to do this, it is indispensable to possess a sufficient knowledge of the region to which the scalpel is about to be applied. This leads me to offer a *résumé* of the topographical anatomy of the flank in the domestic animals, which will allow a better idea of the details of the surgical *manœuvre* it remains for me to describe.

II.—*Anatomy of the Region.*

The *flank*, comprised between the last rib, the anterior crural region, the lumbar region, and the inferior abdominal region, presents at its upper part

—in lean and fasting animals—a depression more or less marked *(hollow of the flank)*, limited inferiorly by a prominence *(ridge of the flank)* running obliquely forward and downward, and becoming more marked as it approaches the external angle of the haunch, where it rises. The composition of the flank is essentially the same in the different domestic animals, so that the description of this region in one is applicable to all.

Passing from the superficial towards the deeper parts, the flank successively presents to view:

1. The *skin*, thin and pliable.

2. The *subcutaneous muscle*, fleshy in a very limited part of the antero-inferior portion of the region.

3. The *great* or *external oblique muscle of the abdomen.* The fleshy portion corresponds to the hollow of the flank and its anterior part. It possesses a medium thickness, and its fibres are directed obliquely backwards and downwards.

4. The *small* or *internal oblique muscle of the abdomen.* This muscle forms a very thick layer, whose fibres pass forward and downward, or in a contrary direction to those of the great oblique.

5. The *transverse muscle.* The fleshy portion of this muscle exists only in the hollow of the flank. Its fibres have a transverse direction, normal to the great diameter of the body.

6. The *peritoneum.*

A loose connective tissue, sometimes more or less charged with fat, slightly unites these different planes one to another.

The *arteries* which are distributed to the flank are all of small volume: they spring from the inferior branch of the *lumbar* and *circumflex iliac arteries.*

The *veins* pass to the confluents of the same name.

The nerves emanate from the *lumbar* pairs.

III.—*Position and Retention of the Animal.*

The larger animals may be operated upon in the standing position, secured either in the travis or stocks, or held against a wall or partition of any kind. Small animals, and the larger ones when troublesome, are laid on their side and secured.

IV.—*Operation.*

The operation is divided into two principal parts: the *incision* and the *reunion* of the abdominal wall.

1. INCISION OF THE FLANK.—The opening into the abdomen should occupy the upper part of the flank, on a line intermediate to the haunch and last rib. This opening may be made in two ways: by *simple division*, or by composite division of the abdominal wall.

(*a*) The *simple* or *old method* consists in making the incision through the different layers of the region, and in the same direction, in such a manner as to form a simple vertical wound, its two lips parallel, and variable in extent according to the size of the animals.

The opening is effected by means of the convex bistoury; the part being previously clipped or shaved, the skin is divided, then the abdominal muscles and peritoneum. The incision of the deeper layers alone presents some difficulty and demands certain precautions, as at this stage there is often embarrassing hæmorrhage in cutting through the chief muscular layers. By using one hand as a guide, and by *taxis*, while the other handles the bistoury, the abdomen may be opened without any injury being inflicted on the organs it contains. If the hæmorrhage is serious, it may be checked by torsion or ligature of the wounded vessels. When the peritoneum is reached,

it is perforated by means of the point of the bistoury, and the opening enlarged by the finger; it is then made of the required dimensions in incising the textures from within to without by a button or pointed bistoury, one or two fingers of the other hand protecting the viscera.

(*b*) *Composite Division*, or *New Method.*—Reflecting on the different disposition of the fibres composing the three principal muscular layers of the region, I have thought that there might be some advantage in dividing each muscle in the direction of its fibres, and so producing successively: 1. A transverse cutaneous incision; 2. Three muscular divisions in a more or less opposite direction—the first running obliquely downwards and backwards: the second oblique forward and downward; and the third transverse, passing in the same direction as the opening in the skin.

In several trials I have found that these muscular divisions can be made with the greatest ease, and almost without the aid of a cutting instrument, by merely tearing through the interstitial connective tissue with the fingers. This occasions but little, if any, hæmorrhage. In the larger animals, the composite wound allows the ready introduction of the hand into the abdomen, and as soon as it is withdrawn, the fibres of each muscle tend to resume their natural position, so that there scarcely remains anything of the opening through the muscles.

It is evident that the opening in the flank made in this manner yields more advantages than the simple or transverse incision, which is always followed by more or less hæmorrhage and muscular retraction. And these advantages are especially marked in the larger animals, in which the opening must always be of a certain size.

2. ABDOMINAL REUNION.—This reunion is effected by double suture. A few separate points maintain the lips of the muscular wound in contact; while the interrupted or continuous suture closes the cutaneous wound. Care should be taken to leave a small opening at the inferior commissure of the wound to allow the end of each of the muscle sutures to protrude, as well as to permit the escape of any morbid fluids which may form in the wound.

When the incision in the flank is small, as in small animals, or when it is made after the new method, the muscle suture is not necessary, closing the skin wound being generally sufficient.

V.—*Results and Consecutive Treatment.*

The usual effects of this operation consist in an inflammation, more or less localised, of the abdominal wall. This inflammation may extend to the peritoneum at once, involve a wide surface, and cause death within a variable period. I am of opinion that a good, large vesicatory application to the region immediately after the operation constitutes, in the case of the larger animals, an excellent means of regulating nutrition in the injured tissues, and so preventing the above-mentioned complications: generalised Peritonitis and Traumatic Fever—infectious or non-infectious. I have always ascribed good effects in great traumatisms of this kind, to the administration for some days—before, as well as after the operation—of a small dose of tincture of arnica—a table-spoonful in the water morning and evening for the larger animals.

(*To be continued.*)

Proceedings of Veterinary Medical Societies, etc.

LANCASHIRE VETERINARY MEDICAL ASSOCIATION.

THE usual quarterly meeting of the above was held at the Blackfriars Hotel, on June 29th, 1880; Wm. Dacre Esq., in the chair.

The SECRETARY read a letter from Council of Royal College of Veterinary Surgeons, expressing their thanks to the society for their hearty support and co-operation in regard to the penal Act. The Secretary stated that in accordance with the alteration of clause two in Rule XVII., with regard to the election of honorary associates, he had forwarded voting papers to all members, with the names of the following gentlemen affixed (who had been proposed and seconded):—Sir F. Fitzwygram, Professor Williams, and Mr. George Fleming. Thirty papers had been returned by members, all voting in favour of the gentlemen named.

The PRESIDENT then said he had great pleasure in informing the meeting that Sir F. Fitzwygram, Professor Williams, and Mr. George Fleming, were unanimously elected honorary associates of this society. (Applause.)

Mr. C. E. Challinor proposed as member of this Association Mr. A W. Briggs, of Bury; Mr. Hopkin seconded, and carried. Mr. A. Lawson proposed Mr. James Polding, of Burnley; Mr. B. Taylor seconded. Carried. The Secretary nominated Mr. J. W. Ingram, of Manchester.

Professor ARTHUR GAMGEE, M.D., F.R.S., of Owen's College, Manchester, delivered the second of two lectures on the Physiology of Digestion. After recapitulating the substance of his first lecture, Dr. Gamgee proceeded to consider the changes which the food undergoes in the small intestines, devoting particular attention to the action of the bile and pancreatic juice. The second of these fluids, he pointed out, possesses, as recent researches have shown, remarkable powers, containing three ferments capable, respectively, of digesting (1st) proteids or albuminous bodies; (2nd) starches; (3rd) by emulsionising and decomposing the neutral fats. These actions were experimentally demonstrated by the lecturer. In the case of the pancreas, the lecturer pointed out that changes in secreting cells may be observed to be associated with the condition of rest and activity. After pointing out the function of the bile—which, while aiding pancreatic digestion by the part that it takes in neutralising the acid chyme, is mainly a substance carrying away from the blood excrementitious matter—the lecturer examined the remaining changes which take place in the alimentary canal, and concluded his lecture by a brief sketch of the views now held of the function of the liver.

Mr. P. Taylor proposed a vote of thanks to Dr. Gamgee, seconded by Mr. T, Greaves, and supported by Mr. Elam, which was carried with acclamation.

Dr. GAMGEE, in response, said it gave him great pleasure to come before the members of the Lancashire Veterinary Medical Association to give a lecture, as every one seemed to take such great interest in the matter, and he hoped on some future occasion to have the opportunity of again lecturing before them, and advised all to read the leading scientific subjects, especially recommending Dr. Foster's "Physiology."

A vote of thanks to the chairman closed the meeting.

SAMUEL LOCKE, *Hon. Sec.*

THE NORTH OF ENGLAND VETERINARY MEDICAL ASSOCIATION.

THE annual meeting of this Association was held in the Turk's Head Hotel, Newcastle-on-Tyne, on May 28th. The President, Mr. D. Dudgeon, occupied the chair.

Professor PRITCHARD read a paper on "Some of the Contagious (?) Diseases affecting Cart-horses." The Professor dealt more particularly on hereditary

diseases, and defined hereditary predisposition as the transmission of the seeds of disease, or a predisposition to disease, from the parent to the progeny; he next gave a list of hereditary diseases, then showed how the disease might disappear. He said a horse which was a "*roarer*" might breed, and the disease might not show itself until two or three generations afterwards. If a horse had been bred of a "roarer," and had not shown any of the disease when young, they might depend upon it, if the horse was subject to some great exertion or some fright, it would become a roarer at once.

A discussion on the paper followed, in which Messrs. Mulvey, H. Hunter, Macgregor, Elphick, Gofton, Corbett, the President,—Stephenson, A. Hunter, and W. Awde took part.

The PRESIDENT next delivered his inaugural address. Amongst other remarks, he said that he thought the tendency of the present age was to overdo everything, and he sometimes thought the Council of the Royal College of Veterinary Surgeons were not exempt from that tendency. He wished it to be distinctly understood that no one valued education more than he did, and in one sense no one could educate a man too highly. But it must be borne in mind that they could not all be army veterinary surgeons; they could not all be located in large cities and have large and lucrative practices. There must still remain a great number of quiet practitioners; nevertheless, those men were as useful in their sphere as their more fortunate brethren. Referring to the Contagious Diseases (Animals) Act, the speaker said that one of their local papers a short time since devoted a leader to what he described as "The Dear Meat Act." Its whole scope and tendency was the very reverse; it had been the means of almost completely stamping out those devastating contagious diseases which only a few years ago proved fatal to their flocks and herds, and cost the country millions of money. He had no hesitation in saying that the firm and judicious action of the Veterinary Department of the Privy Council, aided by the local authorities and their veterinary inspectors, had done more to keep down the price of butcher-meat than all the free importation of foreign stock. He congratulated the members upon the amount of success which had attended this Association during the past year. The good feeling and good fellowship which was developing amongst them, he hoped would continue to develop, and that their membership would be largely increased. In conclusion, he thanked the members for having twice elected him President. (Applause.) He proposed a vote of thanks to Professor Pritchard for his trouble in coming from London and giving them such an interesting paper. Mr. Mulvey seconded the motion, which was carried with acclamation.

Afterwards the members and guests sat down to an excellent dinner, at which all the loyal and other toasts were ably proposed and responded to, and a very enjoyable evening being spent. G. R. DUDGEON, *Hon. Sec*

GLASGOW VETERINARY COLLEGE.

THE summer session terminated on the 12th, and on the 16th ult. twenty-four students presented themselves for their first professional examination. Twenty-one passed a highly-creditable examination, Messrs. W. A. M'Gregor, Freeland, Kelly, Renfrew and Martin passing with "Great Credit." Medals granted by the Highland and Agricultural Society of Scotland, Principal M'Call, and certificates of merit by the College, were awarded in the different branches of study as follows:—

Botany.—Gold medal, Mr. John Renfrew, Hurlet, Renfrewshire; silver medal, Mr. J. F. Hayes, Portroe, co. Tipperary. First class certificates—Mr. James Martin, Glasgow; Mr. W. A. M'Gregor, Pollokshields. Second class certificates—Mr. J. Dickie, Paisley; Mr. P. D. Kelly, Cooraclare.

Materia Medica.—Gold medal, Mr. Hayes; silver medal, Mr. Renfrew. First class certificates—Mr. A. Brown, Neilston; Mr. Martin and Mr. J. Hughes, Knockbridge. Second class certificates—Messrs. Kelly and W. A. M'Gregor.

Chemistry.—Gold medal, Mr. Kelly; silver medal, Mr. Renfrew. First class certificates—Mr. Martin and Mr. Freeland, Glasgow. Second class certificates—Mr. A. Brown, Mr. Reid, Beith; and Mr. W. A. M'Gregor.

NEW MEMBERS OF THE PROFESSION.

AT a meeting of the Court of Examiners of the Royal College of Veterinary Surgeons, held July 6th, the following students from the Royal Veterinary College were admitted members of the profession :—

Mr. Edward Harvey Kelly	Dublin.
„ Frederick Frank Elworthy...	Witheridge, Devon.
„ William Frederick Wright	Yoxford, Suffolk.
„ Johnson William Carlisle	Helton, near Skipton.
„ William Francis Mulcahy	Clonmel, Co. Tipperary.
„ Frederick William Whitney	Tiverton, Devon.
„ John Darby	Hellmorton, near Rugby.

The following students passed their Second Examination at the meeting of the Court of Examiners on July 7th :—

Mr. Harry Redford.
„ Edward Henry Scott.
„ William Green.
„ Henry Hubert Roberts.*
Mr. John William Barford.
„ Arthur Everard Barlow.
„ William Taverner.
„ Joseph Rowbotham Kinsey.*

The following passed their First Examination at the meetings of the Court of Examiners, held July 8th, 9th, and 10th :—

Mr. Frank Glover.
„ Henry Edgar.
„ Thomas Ashton Smith.
„ John Sutcliffe Humdall.
„ Henry Sumner.*
„ Richard Hutton McRaith.*
„ John Warden Edwards.
„ James Smith.
„ Thomas Bolton.
„ Albert Edward Michell.
„ Sydney Slocock.
Mr. Sydney Thomas Doidge Symons.
„ John Buscomb.*
„ James Mark.
„ Richard Barker *
„ Harry Ashley Young.
„ Charles Pack.
„ James Brodie Gresswell.*
„ Alexander Edward Richardson.
„ George Thomas Pickering.
„ Frederick Albert Moss.
„ Herbert Ernest Pinel.

* Thus marked passed with Great Credit.

EDINBURGH UNIVERSITY EXAMINATIONS.

WE have much pleasure in announcing that, at the Summer Session examinations of the Edinburgh University, Mr. A. Grey, Jun., M.R.C.V.S., obtained a bronze medal in the class of Practical Pathology.

Novelties.

SUCTION INSTRUMENT FOR POISONED WOUNDS.

THE value of suction in removing poison from wounds cannot be denied, provided the suction can be resorted to timely and effectively. Whether the poison be that of the snake or other venomous reptile, the saliva of the rabid dog, the blood or other matter of Anthrax-stricken animals, the dangerous

material of putrescent organic matter, or any other virulent or septic stuff which has been suddenly introduced by a wound, suction is a ready means of removing it, and thus averting dangerous consequences. But direct suction, by means of the mouth and lips, may sometimes be attended with danger to the operator, and is not always easy or willingly performed. Of course, when it comes to saving the life of a person, or even sparing them mental anguish or physical pain, very few, we fancy, will hesitate in applying their lips and sucking with all their might in order to withdraw the deleterious matter. But, nevertheless, the repugnance does exist, and it is to overcome this, and also to prevent danger to the person who sucks, that Dr. Dolan, whose name is so favourably known in connection with Hydrophobia, has devised a little instrument, which, if it be at hand when wanted, ought to be most useful. It is something like the pump used for emptying the female breast, but is very much smaller. It consists of a glass tube provided with two bulbs, one of which, at the end, is open, and is to be applied closely over the wound. Into this the blood and poisonous matters are first drawn by means of the india-rubber tubing and ivory mouth-piece, and subsequently into the second bulb which depends from the glass tube, and in this it remains; so that there is no danger of the lips being soiled. Suction, to be successful, should be resorted to without delay, and it is to be feared that this little instrument would not often be at hand at the right moment. Nevertheless, there it is, and even if some delay should occur in applying it, it still comes in useful in washing and cleansing the wound, prior to employing other means of prevention. We have not been able to test by actual practice what appears to be good in theory, but we hope some of our readers will try the instrument, which might also be found useful in other respects. It is made by Aitkin and Co., Bishop's Hill, Yorkshire.

SILK HORSE-CLOTHES.

MESSRS. WALTERS AND SONS, silk manufacturers, of 45, Newgate Street, have introduced silk horse-clothing, which promises to meet several requirements the ordinary woollen blankets do not possess, and which will, no doubt, recommend it to veterinary surgeons and horse-owners. The clothing is made entirely of silk, woven in such a manner that, though the sheet is thick, and the natural warmth of the body is maintained, yet there is no undue accumulation of heat—no perspiring or feverishness. So that, while the temperature is kept up, the silk clothing is light and agreeable. It is also thick, strong, and likely to be very durable, while it has a good appearance. In addition, it is moth and ammonia-proof; and, notwithstanding all these advantages, is of moderate price. As a covering for hard-working or invalid horses, this silk clothing offers many advantages over the ordinary woollen blankets, and it may therefore be recommended to the profession and horse-owners in general.

Army Veterinary Department.

Gazette, June 22nd.

VETERINARY DEPARTMENT.—Veterinary Surgeon John Hammond, Royal Artillery, to be Veterinary Surgeon, First Class.

Gazette, July 6th.

VETERINARY DEPARTMENT.—Veterinary Surgeon Charles Phillips, from the Royal Artillery, to be Veterinary Surgeon.

Obituary.

WE regret to have to announce the death of First Class F. F. S. Constant, Bombay Army, the sad event having occurred on June 14th. Mr. Constant was on his way from Jhelum to Neemuch, and when the train pulled up at Lahore he was found dead in the carriage. The cause of death is supposed to have been heat apoplexy. The heat has been very severe, and the veterinary department in India has suffered to a serious extent, the duties of the veterinary surgeons exposing them more to the sun than almost any other class of officers. Mr. Constant graduated in 1857, and joined the East India Company's service immediately before it was abolished.

The death is also reported of C. H. Wadlow, Oxford, who graduated in 1835, and Mr. P. Avis, of Saffron Walden, who received his diploma in 1872.

Jurisprudence.

HORSE WARRANTY CASE.

[We publish the following case, as bearing out in every particular what Mr. Fleming laid stress upon in his paper on the "Responsibilities of Veterinary Surgeons," read at Manchester in October last, and published in this Journal. The part referred as bearing on professional responsibility, we have marked in this report in italics.]

IN the Dumfries Sheriff Court, Simon Beattie, Preston Hall, Annan, sued William Craig, bank-agent, Dumfries, in the sum of £65, being the value of a horse sold by pursuer to defender, but which proved unsound, was rejected by defender, placed at livery, and sold by public roup, at 40 guineas. After a lengthened proof and debate, the Sheriff-substitute has pronounced the following interlocutor, in which he finds for defender :—

Dumfries, 9th June, 1880.—The Sheriff-substitute having considered the proofs for both parties, and the whole process, after a debate thereon : Finds in fact—1. That on 20th January last the defender bought from the pursuer the horse in dispute for £65, and received delivery thereof on the 30th of said month ; 2. That the horse had then a slight swelling on the front of his off hind fetlock, which was the result of an injury received about two months before when he was jumping a wall ; 3. That the pursuer represented to the defender that this was of no importance, and, before the bargain was concluded, warranted the horse to be sound in every way ; 4. That upon the day after its arrival the horse was tried by being driven about fourteen miles ; 5. That the effect of this was that on the second morning after the trial, when the horse was examined by a veterinary surgeon, the swelling was found to be considerably increased and the horse slightly lame ; 6. That on the same day the defender intimated to the pursuer by letter, No. 10/1 of process, that he would not take the horse as it had been pronounced unsound by a veterinary surgeon ; 7. That the pursuer having been from home did not write a reply, but called on defender on 11th February, when he refused to take back the horse, which was then put up at livery, and subsequently sold by public roup by mutual arrangement of the parties ; 8. That the defender has not paid the price of the horse ; Finds in law, 1. That the condition of the horse's off hind fetlock at the time of sale constitute unsoundness ; 2. That the horse being disconform to warranty the defender was entitled to refuse to keep him or to pay the price. Therefore

sustains the first plea in law for the defender. Refuses the prayer of the petition, and decerns: Finds the pursuer liable in expenses; allows an account thereof to be given in, and remits the same when lodged to the auditor to tax and report.

(Signed) DAVID BOYLE HOPE.

Note.—Three persons were present when the horse was bought, viz., the pursuer and defender and Mr. John Berwick. Two grooms who were present when the horse was looked at were examined for the pursuer, but their evidence on the question of warranty is of no moment, because the sale took place in the house when they were not present, and it is there the defender says the warranty was given upon the faith of which he bought the horse. Both he and Mr. Berwick distinctly affirm that the pursuer warranted the horse sound in every respect, and against their word there is only that of the pursuer, who avers that he only said the horse was sound so far as he knew; and that even from that statement he excepted the fetlock in question. Even if this were all the evidence the S.S. could not help finding it proved that a warranty of soundness was given. But there are one or two circumstances which give a corroboration derived from inference. The defender and his clerk, John Clark, aver that when the pursuer called on the defender on 11th February the latter said that he had bought the horse as sound, and that the pursuer did not deny this, but maintained that the horse was sound. Further, John Craven, the defender's servant, says that when pursuer brought the horse to his master's stable, he asked if he (Craven) could get a veterinary surgeon, as he wished him examined before he left Dumfries. He says he was about to go when the pursuer said he would go himself, and that when he came back he said that Mr. M'Intosh was from home, and that the horse would be examined next day. The pursuer denies that he said anything about getting a veterinary surgeon, but admits that "something may have been said" by Craven about that. He does not, however, state what was said. Mr. M'Intosh says that a message was left at his house that day for him to come and examine the horse, but that he was from home. He does not know who sent or brought the message. The S.S. does not think that the inference necessarily is that the pursuer gave the message. He rather thinks it must have been the defender (who was not asked if he did so) because he says that when the pursuer called on him that day along with Mr. Mather, he told him that Mr. M'Intosh was from home. Mather says that the defender told the pursuer that he was going to have the horse examined by Mr. M'Intosh, and sent him a cheque the next day. He also says that before the horse came to Dumfries the defender had told him that Mr. M'Intosh was to examine the horse, and that he "may have told that to the pursuer."

From all this it appears that the pursuer was quite aware that before he got the price of the horse it was to be examined, and the irresistible inference is that it was because there was a warranty. Further, whenever the pursuer knew that the defender rejected the horse as unsound, he got veterinary surgeons to examine it, a thing which there was no occasion for him to do if he sold the horse without warranty.

It was argued for the pursuer that the warranty is not proved, because the two witnesses do not state in precisely the same words. References were made to the Mercantile Law Amendment Act, and to the cases of Robeson *v.* Waugh (2 Rette, p. 63) and Mackie *v.* Riddell (2 Rette p. 115). The defender's is a follows: "I then asked the pursuer if he would warrant the horse sound in every way, and he said that he would warrant him sound in every way, and that if he did not know him to be so he would not sell him to me."

Mr. Berwick says: "In the course of conversation in the house, defender asked pursuer if he would warrant the horse sound and right in every respect, and he said that certainly he would, and that if he was not all correct he would not put him into his hands." The S.S. is of opinion that these versions agree so substantially as to meet all the requirements of law in reference to a verbal warranty.

It was also argued that even if a general warranty of soundness was given, the injured fetlock was necessarily excepted, because it was seen by and even pointed out to the defender; and there is a plea on record to the following effect: "The defender having been made aware of the thickening of the skin of the fetlock by the pursuer prior to the sale, is barred from objecting thereto after having taken delivery of the horse." The answer to this is, that the defender did not reject the horse for the mere external blemish here referred to, but because the injury was deeper than the skin, and such as he could not discover himself either by eye or touch. *And this leads to the second and the most difficult branch of the case, viz., the question of soundness. The conflict of evidence is truly puzzling. The defender has produced eight veterinary surgeons, including two principals of colleges and a lecturer, and other practitioners of eminence, who declare that the horse is unsound. The puruser has produced eight also, including a principal of a college, and other men of eminence, who declare that the horse is perfectly sound. It is alleged by defender's witnesses that there is a Spavin in one hock, and some of them say in both hocks. In the face of the evidence brought for the pursuer, the S.S. is unable to find out whether the horse has Spavin or not, and as the burden of proof lies upon the defender he has failed to establish this cause of unsoundness.*

But in regard to the injured fetlock, the S.S. has had less difficulty in coming to a decision, although, on this point also, the evidence is most conflicting. He does not think it necessary to analyse the evidence at any length, because he has not based his decision upon anything except certain facts which he considers proved, and which theoretic evidence, or evidence of facts applicable to a later date, cannot disprove.

The defender says: "Mr. M'Intosh came on the morning of 2nd February, and found the thickness of the hind leg much increased. "I had noticed this myself," John Craven says. "I was again present on the Monday morning when Mr. M'Intosh again examined the horse. The fetlock was more swollen than it had been on the Saturday. The horse had received no injury to cause this in the interval."

Mr. M'Intosh says: "I found the fetlock joint much enlarged, considerably more so than on Saturday, and the horse showed slight lameness in that leg. The lameness passed off after the horse had been run for a short time." And then he proceeds very minutely to describe the symptoms of unsoundness which he found on examination. Now, here are three witnesses who speak to a fact which requires no professional skill to discover. If there had been no swelling produced by the exercise, the S.S. would have had to balance the professional evidence alone, and the task would have been more difficult. It is to be kept in view that the defender was pleased with the horse and meant to keep it, provided it was passed as sound by Mr M'Intosh. There was therefore no reason for either of them trying to make out a ground for returning the horse. Defender was even willing to keep the horse if afterwards Professor M'Call had pronounced it sound. How does the pursuer get over this evidence? In the first place, he has called veterinary surgeons Mr. Paterson and Mr. Tait, who examined the horse on the 3rd February—one day later than Mr. M'Intosh. Mr. Paterson's evidence to some extent confirms that of Mr. M'Intosh. He says: "There was a slight enlargement of the hind fetlock, which was principally caused by a

thickening of skin. I could not detect any injury to the tendon, but there was a slight fluctuation under the skin, indicating the presence of synovial fluid."

This is spoken of by all the witnesses as an indication of inflammation. Mr. Tait says that he saw no indication of this, and that the horse was sound. Mr. Paterson at first said, "I considered the horse sound for all practical work, and would neither have rejected him myself nor recommended a client to do so," and afterwards that he was perfectly sound. It must be remembered that neither of these gentlemen had seen the horse before that day, at least after it came into defender's possession, and therefore had no means of telling whether exercise had had any bad effect, and neither of them saw the horse ridden or driven. The next person who examined the horse on behalf of the defender was Professor M'Call, and he subjected it to a similar test as did Mr. M'Intosh. After examining him he declined to give a decided opinion until he "had the horse galloped, and seen what the result would be the next morning." This was done, and the next morning he "found the fetlock joint more enlarged than on the previous day, and the horse decidedly lame."

None of the pursuer's witnesses put the horse to any such test, at least till long after this, and many of them examined it so long after that their evidence is useless to contradict the evidence above referred to. *The dogmatic, conceited way in which some of them delivered their opinions, and the testy manner in which they resented cross-examination, gave them more the appearance of partisans than skilled witnesses.* The question, then, as the S.S. views it, is this, Was the defender, having received a warrant of soundness, obliged to keep a horse whose injured leg became swollen whenever it was used, and who, as a consequence, was stiff or lame the next day? He thinks not. The defender was entitled to have a horse of which he could get the full use, and he was not bound to wait until he got better, which might very likely be the case after rest and the use of remedies. It is mentioned that the horse is all right now. That may be so, and the S. S. has given no decision upon that point. But the defender was not bound to keep the horse to see if it got better. This principle was affirmed in the case of Begbie *v.* Roberton (6 Shaw, p. 1,014), the rubric of which is as follows: "A mare being sold, warranted quiet in harness, but proving liable to shy greatly at meeting stage-coaches. Held, though she was completely cured in a short time after being returned, that the purchaser was entitled to refuse her, and was not bound to break her in for the use of which she was warranted fit at the time." The Lord Justice Clerk said: "The horse must be fit at the time he is bought for the work he is warranted to perform, and it is not the duty of the purchaser to break him in, and though at the distance of some months it is shown that the mare is quiet, yet that does not weaken the prior evidence as to her unfitness at the time of sale."

It is averred on record that the pursuer knew the horse was unsound when he sold it. The S.S. does not see that that is proved. He very likely, as he said, believed it to be sound, and that was why he gave the warranty. The horse had been under no professional treatment after its accident, and he probably did not know how much it had been injured. It had been at rest, and probably was only exercised upon grass land, or at all events but gently.

It is much to be regretted that so great expense should have been incurred when the pecuniary interest at stake was so small, there not having been a very heavy loss when the horse was sold by auction. The pursuer's claim in any event would have had to be restricted to one for the difference between the prices. (Intd.) D. B. H.

Notes and News.

SPREAD OF DISEASE BY THE AGENCY OF EARTHWORMS.—Recent researches by M. Pasteur appear to throw considerable light on the origin of Anthrax, or Splenic Fever, and allied diseases which attack cattle, sheep, etc. When an animal dies of Anthrax it is not uncommonly buried on the spot. The conditions of putrefaction prove fatal to the small parasitic organism, or *bacteridium*, which is abundant in the blood at death. The gas given off causes it to break up into dead and harmless granulations. But before this can occur not a little of the blood and humours of the body has escaped into the ground about the carcass, and here the parasite is in an aerated medium favourable to the formation of germs. These corpuscular germs M. Pasteur has found in the soil, in a state of latent life, months and years after the carcass was buried, and by inoculation of guinea pigs with them, has produced Anthrax and death. Now, it is specially notable that such germs have been met with in the earth at the surface above the place of burial, as well as near the body. The question arises, How came they there? And it would appear that earthworms are the agents of conveyance. In the small earth-cylinders, of fine particles, which these creatures bring to the surface and deposit after the dews of morning or after rain, one finds, besides a host of other germs, the germs of Anthrax. (The same process was proved also by direct experiment; worms kept in ground with which *bacteridium* spores had been mixed, were killed after a few days, and many of the spores were found in the earth-cylinders in their intestines). The dust of this earth, after the cylinders have been disaggregated by rain, gets blown about on the neighbouring plants, and the animals eating these thus receive the germs into their system. It is suggested that possibly other disease germs, not less harmless to worms, but ready to cause disease in the proper animals, may be, in like manner, conveyed to the surface in cemeteries. This would furnish a fresh argument for cremation. The practical inference as to Anthrax is, that animals which have died of this should not be buried in fields devoted to crops or pasturage, but (wherever possible) in sand, calcareous ground, poor and dry—unsuitable, in a word, for worms.

PROTRACTED ABSTINENCE FROM FOOD.—A remarkable case of enforced abstinence is reported in a Yorkshire paper. The fire which was discovered about three weeks ago in the Croftside pit of the Darcy Lever Coal Company, about two miles from Bolton, was still burning last Saturday. The flames had travelled along the workings for about 400 yards, and the damage is estimated at several thousand pounds. Strange to say, two ponies which were in the mine have been found alive, although they had been imprisoned for fifteen days. One of the animals had broken loose from the stable and had discovered a stock of hay, and was therefore as lively as ever. But the other was fastened up in the stable, and was so weak and emaciated that it could scarcely stand, having tasted neither food nor water for the whole of the fifteen days. The poor animal was tenderly nourished, and is now rapidly recovering from the effects of its long abstinence.

BRITTLE BONES IN CATTLE.—In the Austrian Quarterly Review of Veterinary Science, Herr Dobusch, of Hohenfurt, publishes some cases illustrating forcibly the direct influence of the quality and composition of water upon the occurrence of *fragilitus ossium*, or bone brittleness in live stock. The owner of some affected cows by whom Herr Dobusch was consulted in his professional capacity, stated that within the last twenty years about 130 of his cattle had been attacked by this disease, about half of which had to be slaughtered on account of actual fracture of the bones, while the rest were

rescued by timely removal in carts to another farm in a neighbouring village. Every kind of treatment had been tried, both by giving medicines of all sorts to the animals, and by treating the pasture land with lime. On his first attendance Herr Dobusch could discover no apparent cause for the evil. The food consisted chiefly of hay, straw, and potatoes, all of which were of excellent quality. On his recommendation some prepared bone-meal was given with a little common salt three times a day, but no good result followed. Thereupon he undertook the examination of the drink-water, which was obtained from a spring near the farmyard, and conducted thither by wooden pipes. This was perfectly clear, colourless, and free from smell; it tasted remarkably soft, and retained these characteristics after it had stood for some days. On chemical analysis no trace of salts could be found, so that it might readily have been taken for rain or distilled water. Upon this the cattle were given water from another spring. This had a harder and fresher taste, and was found on analysis to contain carbonate, sulphate, and phosphate of lime, and chloride of magnesia, although but in small proportions. The effects of this change of water were thus noted:—1. The animals drank half as much again as before. 2. The worst diseased cows at once began to get better, and this was the first occasion on which any of them had recovered without removal. 3. The cows gave more and better milk than before. 4. The oxen showed far better condition than could be previously attained on the best of food and with the most careful attention. 5. No fresh cases occurred as soon as the change of water was introduced. Some time afterwards the owner of the cows was prohibited from using water from the second spring under pain of legal proceedings against him, and was thrown back upon the original supply. The animals at first refused it, began to lose flesh, and some of those that had recovered had relapses. By this time arrangements had fortunately been made for the renewed use of the wholesome water, and immediately the cows were again put upon it all its previous beneficial effects were repeated. From this evidence Dobusch arrived at the conclusion that the improvement was due solely to the influence of the water, and considers that the relations between lime-salts in the water and softness of bone deserve far more consideration on the part of stock keepers than is generally accorded to them.

THE INOCULABILITY OF ANTHRAX.—In a recent communication to the Paris Academy of Sciences, the Veterinarians Arloing, Cornevin, and Thomas arrive at the following conclusions:—1. Symptomatic Anthrax of cattle (bovine carbuncle) is inoculable in the ox and in certain other animal species. 2. It is transmitted by a microscopic organism which germinates in the muscular and connective tissues of the tumour, and which is seldom or never found in the blood; it must, therefore, be sought for in the tumour. 3. This microscopic organism is kept back by the plaster-of-Paris filter. 4. It differs distinctly from the *Bacillus anthracis* in its characteristics, in the effects produced by it, and in the animal species concerned in its evolution 5. Therefore bovine symptomatic Anthrax should no longer be confounded with Anthrax in the group of anthracoid affections.

TRICHINOSIS IN ENGLAND.—In the last annual report on the health of the Dunmow Rural Sanitary District, Dr. Armistead records an interesting outbreak of Trichinosis at Thaxted, in Essex, in June of last year. Fifty-two persons had eaten sausages purchased from one individual, and of these. forty-four were very ill, and three only slightly affected. Some of the pork used in making the sausages was salted, and probably foreign; and it was only in certain portions that Trichinæ were found. Children were much less severely attacked than adults.

POISONING BY DARNEL.—We learn that horses and other animals have been poisoned by darnel or drake-weed (*Lolium temulentum*) at Melbourne. Mr. Graham Mitchell, F.R.C.V.S., and Baron Von Mueller have established the fact beyond a doubt.

HYDROPHOBIA.—In the neighbourhood of Cwmferlin, Rhymney Valley, more than fifty dogs have been destroyed on account of an outbreak of Rabies. A boy who had been bitten by one of them has died from Hydrophobia. Another death has occurred from Hydrophobia in Dublin. In March last, a carter picked up a stray dog and patted it on the back, when it snapped at him and inflicted a slight wound on his nose. The animal then ran away, and was no more heard of. The wound healed and the man thought no more of the occurrence until the commencement of July, when he became ill, and was admitted to the Mater Misericordiæ Hospital, where he quickly succumbed.

HORSE-POX.—According to the *Gazette Medicale*, among the horses of a German horse-dealer, on May 5th, M. Alexander showed to M. Le Blanc a case of horse-pox in a well-bred animal from Germany. Lymph from this animal was inoculated by M. Chambon, on a three-months-old heifer, by three punctures on the udder. These inoculations were most successful, and from the heifer another was as successfully inoculated on May 13th. On the 19th there was a very fine vaccinal eruption, no fewer than sixty pustules being present. With the lymph from these two other heifers were vaccinated, and from them the vaccination department of the Societe d'Hygiène was amply supplied with lymph for vaccination purposes.

Correspondence, etc.

THE FITZWYGRAM PRIZE COMPETITION.

To the Editor of the VETERINARY JOURNAL.

SIR,—The competition for the Fitzwygram prizes for this year has just been completed, and I venture to make one or two remarks with regard to it. It appears that there were three competitors—one from the Royal Veterinary College, one from Dick's College, and another from the New Veterinary College, Edinburgh. The written examination took place first, as usual, and it appears the competitors from the London and Dick's Schools did not obtain the necessary number of marks to enable them to go on with the competition, while the Gayfield School competitor managed to scrape through this part of the task. But, strange to say, he was awarded the first prize; though this was all the test to which he was subjected, the practical, and therefore by far the most important part of the test, having been omitted in his favour. Now, sir, I venture to ask if this gentleman can be considered to have fairly won the first prize, or if we may not rather consider that it has been *presented* to him, without adequate evidence that he deserved it? Supposing he had undergone the practical test, and failed—which was not at all unlikely, would he then have been deemed worthy of the first prize? I and some of my fellow-students cannot help thinking that if this highly-favoured competitor had belonged to any other school, he would not have been

so handsomely rewarded, and we do not consider that the prize has been fairly and openly won. It has been given as a kind of concession to a school which has hitherto always failed to carry it off, but which appears to need this patronage. Compare the award made this year with the competition in which Mr. Bull, though he gained the requisite number of marks in the written and *practical* tests, was yet denied the first prize; while one of Professor Williams' students, who was only submitted to a comparatively unimportant test, receives the highest prize. We hear much about the necessity for practical knowledge, and we were given to understand that these prizes were instituted to promote this knowledge. What can we think of them, when we find the blue ribbon bestowed upon a competitor for the simple reason that he has not won it, but apparently because he belongs to a school which hitherto could not win it, and would not now unless it were specially favoured? This is not encouraging to competitors, but the reverse; and I hope, for the credit of the donor, that these prizes will be bestowed without regard to school or competitor. *Palmam qui meruit ferat.*

Your obedient servant,

London, *June 28th.* "A VETERINARY STUDENT."

THE VETERINARY PROFESSION A POLITICAL FORCE.

To the Editor of the VETERINARY JOURNAL.

SIR,—The veterinary profession, up to a few months ago, had for long and weary years been dragged hither and thither by discordant forces in England and Scotland. It was like a ship in a troubled sea, tossing about under the undecided orders of several, no doubt, well-meaning captains, but each possessed of different ideas.

By the late happy reconciliation of the English and Scotch forces it has been enabled to start in a new life, and we now see all united to promote the prosperity of the Royal College of Veterinary Surgeons. Its Scottish recruits are already proving themselves some of its ablest and most energetic well-wishers. Their good wishes are substantial and take a practical form, for they spare neither time, money, nor the trouble and inconvenience of long railway journeys to advance the profession.

The profession urgently wants the Penal Act, and has to seek it through Parliament.

It is time for the profession to see that it is itself a political force. It numbers nearly two thousand veterinary surgeons, who, in the pursuit of their avocation, are constantly going among all classes of men. The great majority take much interest in politics, and can much influence the opinions of their clients, especially in agricultural districts. Often when watching a case, a veterinary surgeon has to remain hours at a place, and nothing is more common than for the conversation to drift into that fascinating subject, politics. I know one veterinary surgeon who, for public reasons unnecesssary here to state, made it his study to try to get votes, and I understand that he succeeded in changing twenty voters to the side he had chosen. I also heard of another who got eight votes. These were incidents of the late general election.

In considering whether the profession is a political force, we must remember that in every constituency there is a large number of voters who are very undecided, some from apathy and some from want of political knowledge. A little decides them, and in very many elections ten or a dozen votes on one

side or the other carry the day. A reference to the returns of the last general election will show in how many cases a majority of under fifteen was sufficient, and the Evesham election, a few days ago, was carried by two votes. We may say that, especially in agricultural districts, voters are, and will be, much influenced by being "talked to."

It is now everywhere acknowledged that veterinary medicine is a great and important fact. Its usefulness can no longer be ignored. We see that in the army it has been judged expedient to establish a veterinary school; we see at last the medical profession quoting and acknowledging the benefit of the labours and researches of veterinary surgeons both here and on the continent; we see veterinary inspectors appointed all over the country to prevent the dissemination of the contagious and infectious diseases of animals. A few years ago, such inspectors were unknown and—*testé* the Cattle Plague—the wise warnings of our profession were derided and scorned. The public press no longer regards a veterinary surgeon as one whose sole idea is to bleed and give a ball, but shows how changed is opinion, by gladly admitting the letters of members of the profession to its columns.

The profession, then, has stormed the strongest outworks of ignorance and prejudice which so long opposed it, and has now a comparatively easy task before it. Less than fourteen years ago it stood apparently friendless and isolated. Thanks to a band of brave and resolute workers who, undismayed by prophecies of disaster, never flagged in their efforts, it has compelled recognition, and stimulated by their example, we see this band of pioneers now augmented by hundreds of earnest and thoughtful workers. If so much has been done by a disunited profession in fourteen years, how great and encouraging is the inducement to persevere now that union prevails!

It is a homely but wise and true saying, that all occupations are appraised by the State at their market value; the deduction is obvious, and the profession cannot fail to see its application to itself.

Yours faithfully,

9th July, 1880. "A VETERINARY SURGEON."

THE USE OF THE TROCAR AND CANULA IN FLATULENT COLIC.

To the Editor of the VETERINARY JOURNAL.

SIR,—At the meeting of the Liverpool Veterinary Medical Association, held at the Medical Institute, Hope Street, on the 14th ult., I was much astonished on reading Mr. Faulkener's communication on the use of the trocar in Flatulent Colic, in which he claims to be the inventor of the almost identical instrument made especially to order for me by Messrs. Arnold and Sons, Smithfield, London. As the ensuing discussion on the subject is not detailed in the Journal, perhaps a few remarks on the instrument used by Mr. Faulkener may not be out of place. The extreme diameter—a quarter inch—is in itself objectionable, requiring an incision previous to introducing the trocar; this first incision being the principal cause of the succeeding abscess. I have frequently advised several of my colleagues who have often had recourse to the operation, not to make any incision, but merely to remove a small quantity of the hair before operating, and it is seldom any swelling ensues. Mr. Faulkener's instrument, from its calibre, is very apt to become blocked with ingesta, and requires the re-introduction of the trocar. In the

instrument suggested by me, the escape of gas is never impeded, although the diameter of the canula does not exceed one-eighth of an inch.

What I find to be successful in cases of Flatulent Colic, is the early use of the trocar, and not to put off until you give a trial to a number of doses of medicine.

Messrs. Arnold and Sons inform me that they have sold a very great number of the above instruments, and that they give every satisfaction.

I am, sir, yours faithfully,

Balloan, Beauly, 12*th July*, 1880. ALEX. GUNN, M.R.C.V.S.

"COMMENTS ON PASSING EVENTS AND VETERINARY PRACTICE."

To the Editor of the VETERINARY JOURNAL.

SIR,—I am not prone to scribbling, because I dislike reading nonsense, and fear I am now doing wrong; if so, I pray you and your readers will pardon me. From 1854 to a recent date, I have been a subscriber to your *contemporary*. During that time I have noticed *effusions* that have pained me, but never so acutely as the one under the above heading in the May number. "*Verbatim et literatim*," says the editorial note—"as it contains food for thought" . . . . . Well, sir, I have thought, and I am still thinking; my thoughts cannot be gathered together; I cannot comment, for truly I am absorbed in thought and grief. Poor dear old Morton! whatever would he say? So fond of a good joke, too! I am sure this joke, for such I take it, would have caused my friend to *blush* instead of *smile*.

Pass it off as a joke—do, sir! for I am off on the Continent this summer, and shall feel so ashamed. Obediently yours,

Hotel, Brighton, *May* 14*th*, 1880. "TREMBLING X."

P.S.—Sed tamen amoto quæramus seria ludo.

A CELOSOMIAN MONSTROSITY.

To the Editor of the VETERINARY JOURNAL.

SIR,—I beg to inclose a rough sketch of a "Celosomian Monstrosity," of which a cow belonging to Mr. Bint, of Matham, Herefordshire, was delivered without assistance on the morning of the 25th. I was requested to attend, but the birth had taken place just before my arrival. The spine was curved upwards and backwards, the lumbar vertebræ being principally concerned, the tail lying along the neck; the ribs were turned upwards, the heart and lungs lying against one side and covered with a thin transparent membrane. The abdominal viscera had no covering when I saw them, though they were all attached to the fœtus.

The presentation was a hind one—that is, the head and legs did not appear first. I have the honour to be, sir,

Your obedient servant,

Malvern Link, *June* 25*th*. HENRY GOULE.

[The sketch forwarded by Mr. Goulé represents a typical Celosomian Monstrosity, such as is described and figured in "Veterinary Obstetrics," and closely resembling one exhibited not long ago at the Central Veterinary Medical Society.]

EXTRAORDINARY FECUNDATION.

To the Editor of the VETERINARY JOURNAL.

DEAR SIR,—A gentleman whose veracity there is no questioning, lately communicated to me the following statement:—"About two months ago a white-and-black tame rabbit produced six young ones, which, on being looked at, she killed. About a fortnight since she again produced twelve young ones, all of which are doing well. In the *interim* she had been in a wire box with another doe, which also has lately had young ones, and had no access whatever to any other rabbit—male or otherwise.

"There are only two rabbits on the place, which are and fed attended by children, the pen is always locked, except at feeding-time, and the keys kept indoors. It is impossible for the rabbits to get any communication with wild rabbits or any other."

What I wish to ask, Mr. Editor, is, if, in the extended range of your researches, you know or have ever heard of a parallel case?

Yours, etc.,

ENQUIRER.

[We have certainly never heard of such a case of fecundation, except in the days of miracles. A male creature is nowadays looked upon as necessary in reproduction.]

TO CORRESPONDENTS.

F. H.—There is no better text-book on Anatomy than Chauveau's, whether for beginner, student, or practitioner. It is the student's manual in all the French, as well as in the Swiss and Belgian schools. Pillischer, of New Bond Street, supplies good microscopes for students; the price is low, and for histological and pathological work you will find them all that is necessary.

Communications, Books, Journals, etc., Received.

COMMUNICATIONS have been received from L. Butters, Norwich; J. A. Nunn, Royal Artillery, Afghanistan; C. Whitworth, London; T. Flintoff, 8th Hussars, Afghanistan; J. Cammack, Cape Town, South Africa; F. Harvey, St. Columb; J. H. Steel, London; H. Goulé, Malvern Link; A. Gunn, Balloan, Beauly; Captain Russell, Grantham; G. R. Dudgeon, Sunderland; G. A. Banham, London; S. Locke, Manchester; "A Veterinary Surgeon"; E. Faulkner, Manchester; A. Hill, London; F. F. Collins, Simla; "A Veterinary Student."

BOOKS AND PAMPHLETS: *Dr. H. Möller*, Die Hufkrankheiten des Pferdes; First Annual Report of the Cornell University Experiment Station; *P. Mégnin*, Les Parasites et les Maladies Parasitaires; *I. B. Derache and J. M. Wehenkel*, Formulaire de Poche; *F. Deneubourg*, Traité Pratique d'Obstétrique; *J. H. Steel*, Preliminary Notes on Individual Variation in Equus Asinus.

JOURNALS, ETC.: *Deutsche Zeitschrift für Thiermedicin; Annales de Méd. Vétérinaire; Wochenschrift für Thierheilkunde und Viehzucht; Lancet; Echo Vétérinaire; Der Thirarzt; Journal of the National Agricultural Society of Victoria; Repertorium der Thierheilkunde; New York Veterinary Gazette; Archiv für Wissenschaft. u. Practische Thierheilkunde; American Veterinary Review; Archives Vétérinaire; Recueil de Méd. Vétérinaire; Archives of Comparative Medicine and Surgery; American Live Stock Journal; Oesterreichische Vierteljahresschrift für Wissenschaft. Veterinärkunde; Live Stock Journal; Medical Press and Circular; Journal de Médecine Pratique et de Zootechnie.*

NEWSPAPERS: *Melbourne Leader; Birmingham Daily Post; Hereford Journal; Irish Times; Cork Constitution; Scotsman; Philadelphia Record.*